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A Modern Rifle Range.

An association has been formed in New York for introducing here the scientific rifle practice which has produced such great results in England and Canada. They have purchased ground at Creedmoor, Long Island, and are fitting it with a full sett of targets and other fixtures. They have received State aid, their labors are hailed with enthusiasm by the National Guard, and their enterprise is, we are glad to say, a thorough success. In the fitting up of these ranges there are some points which are well worth attention, especially as scientific rifle practice is, beyond a doubt, destined to be a favorite pursuit throughout this country.

In early English matches round targets were used, but afterward the oblong or "military" target was introduced. The shape of this is governed by the fact that the main requirement in military shooting is accuracy in regard to height, while an error to the right or left is less liable to cause the loss of the shot. A target is now built up of slabs of wrought iron one-half inch thick, 2 feet wide and 6 feet high. A Third Class target, for use up to 200 yards, is 4 feet wide; a Second Class, for ranges from 200 to 500 yards, is 6 feet wide; and a First Class which is used up to 1000 yards range, is 8 feet wide; all are six feet high. They thus represent a certain front of men. Such is the force of the bullets that the half inch boiler iron is sometimes broken through by several bullets striking in one spot. It is double at the centre and reinforced at the back by angle irons.

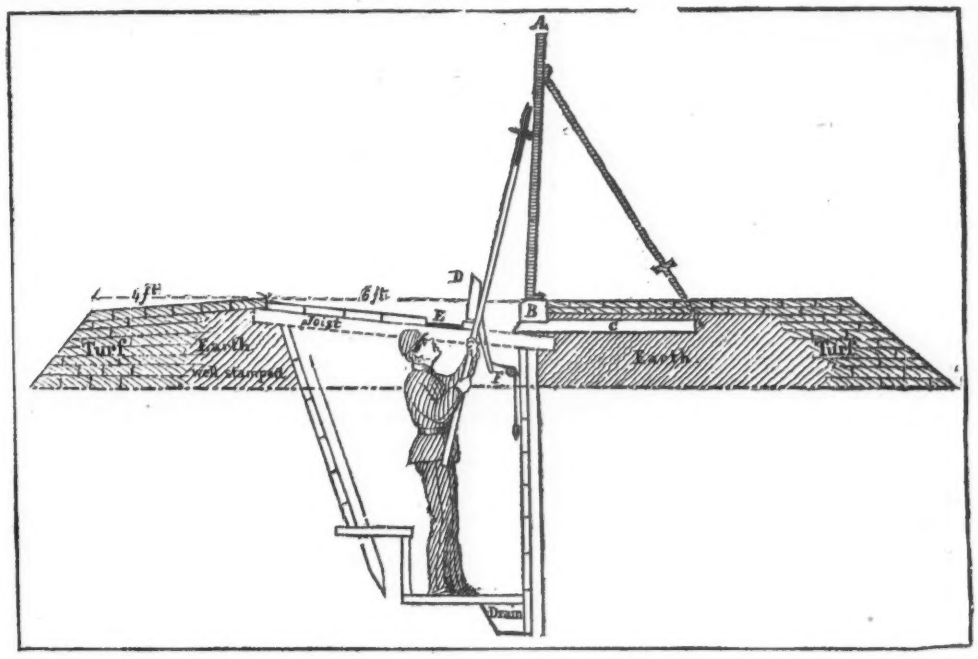

Fig. 1.—TARGET AT CREEDMOOR RANGE; SCOBLE'S SYSTEM.

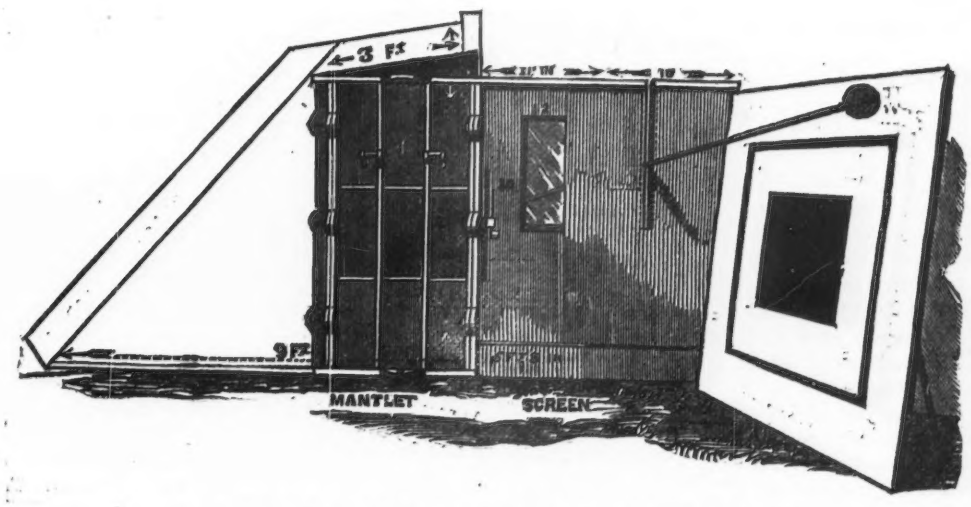

Fig. 2.—TARGET AT CREEDMOOR RANGE; HILL'S SYSTEM.

An excellent system has been devised for obtaining rapid and accurate work in marking. The marker remains always close to the target, and as soon as a shot strikes he "paints out" the spot by means of a brush fastened on a pole. This pole also carries a disc of sheet iron, the color of which indicates to the marksman the position of his shot on the target. The colors are white for the bull's eye, red for the center and black for an outer. When the target is not hit the marker merely waves his disc to and fro without putting it in front of the target. Ricochets are indicated by a red flag waved in front of the target.

Few persons appreciate the enormous force of a 400 grain ball fired with 70 grains of powder; or the still heavier ball and powder charge used in England. The Remington and Springfield rifles have a velocity at the muzzle of about 1265 feet per second and

At 200 yards penetrate 11 inches of pine plank.
At 600 yards penetrate 6¼ inches of pine plank.
At 1,000 yards they penetrate 3¼ inches of pine plank.

Striking an iron target the bullet flies into minute fragments, leaving a neatly made "star." A ricochet (which does not count) makes a long mark, the edge of which is an ellipse, and it is easily distinguished from a straight shot. Inasmuch as the marker remains constantly by the target he must be housed in such a way as to make him perfectly safe. Two methods for effecting this are in use. In one the marker is placed in a pit dug in front of the target, in the other he sits in a small house at the side, The details of the former system, as used in this country, have been worked out by Lieutenant Colonel SCOBLE of Toronto, a gentleman who is a civil engineer of much experience, and at present engaged on the International Bridge as engineer for the contractors. His method is clearly shown in figure 1. The marker stands in the pit, from which he can see the whole of the target at a glance through the window E. When a shot strikes he opens the trap D and thrusts through it the proper disc carrying a brush with which he marks out the shot. His safety is ensured by 4 to 6 feet of well stamped earth behind him.

The other style of butt is known as HILL'S system. One form of it is represented in figure 2. Target slabs bolted together form the back and protect the marker from injury, while the side is made of 2 inch plank in which a window 1×1½ ft. and a slot 2

inches wide are cut. He sees the position of the shot through the window, and immediately thrusting the disc through the slot paints it out. These butts are usually made with a 4 inch wood back, faced with several feet of well stamped earth, instead of target slabs.

It is difficult to decide between these two systems. Both allow of the most rapid work, and the marker has usually finished before the marksman is ready for another shot. Shots succeed each other at the rate of one in three-quarters of a minute, and in five minutes the marksman ought to take his position, fire his five shots and retire. Competitions usually include trials at three ranges, 200, 500 and 1,000 yards, five shots each.

The range of the National Rifle Association will comprise from 15 to 20 targets, and will be capable of "shooting" 12 men an hour to each target. With the last mentioned number of targets a militia regiment 240 strong (which is about the average) can finish a competition in 4 hours, which allows an hour at each range, and half an hour for each of the two removals.

The Manufacture of Iron and Steel.

Mr. EDWARD RILEY, whose constant labors in the elucidation of all important questions connected with the production of iron are so well known, delivered before the Chemical Society of Great Britain, on May 2, 1872, a lecture on the constitution of pig iron, which is reproduced below. New views of the causes which make iron white or gray have come up within a few years, and it will be seen that Mr. RILEY offers much that is of great value in connection with this new theory of iron making.

One cannot conceive any process so simple and requiring so small an amount of labor as the present system of iron smelting in blast furnaces; we may still further improve that system by diminishing the consumption of fuel, increasing the make, and improving the quality of the pig. Still, with the prospect before us of increased cost for labor, I am at a loss to see how any process can compete with it, except, perhaps, in very exceptional cases for steel of a high class where quality is the sole object and cost quite a secondary consideration.

Taking pig iron as a starting point, I propose considering briefly the various varieties of pig iron made from different ores and in different districts.

It is, however, somewhat difficult to give a general idea as to the composition of pig iron in certain districts, as the varieties of ore used are so numerous, and vary so much according to circumstances, that no approximate composition can be given to the pig made.

There are, however, certain districts where, from local circumstances, the same ore and fuel are used constantly. In such districts there is not much variation in the pig made, each having a distinct character. Such varieties of pig are hematite pig, chiefly made in Lancashire and Cumberland; Cleveland pig, made in the North Riding of Yorkshire, in Durham, and Northumberland; best Yorkshire cold blast pig, Lincolnshire pig, and Northamptonshire pig. In South Wales, Staffordshire, Derbyshire, and Shropshire, so many varieties of ores are used that pig of all descriptions is made. Even in some of the special districts named the large demand for, and the increased cost of native ores (ores of the district), and the advantages derived from the admixture of foreign ores has caused the introduction of the latter, and in some cases necessarily altered the character of the pig produced.

In considering the quality of pig iron commercially, taking price as a criterion of quality, it will be found that pig iron which commands the highest price is by no means, chemically speaking, the purest and the most free from the so-called impurities in iron. This holds good, except, perhaps, in one single instance, viz., that of charcoal hematite pig, smelted at Hot Barrow. This pig commands a higher price than any foreign charcoal iron, being used almost exclusively for the manufacture of the best malleable cast iron by annealing castings from iron from the pig in red hematite.

IRON FROM THE CLAY IRONSTONE.

Pig iron made from the clay bands of the coal measures commands the highest price in the market, and it is from these ores that the best qualities of bar iron and boiler plate are made. The high quality of the Low Moor Bowling and generally of the best Yorkshire iron is attributed to the quality of the ore and the freedom of the coal from sulphur.

The coal used is known as the Better Bed coal, and is a thin seam not more than from 16 to 18 inches in thickness. A section of this coal taken through the whole thickness of the bed, and intimately pulverised together, gave :—

BETTER BED COAL BOWLING.

Ash per cent.	5.86
Sulphur per cent.	·51
Moisture	2·21
Coke per cent.	68·41
Volatile matter	31·59
	100·00

The percentage of sulphur in the coal is certainly low; although I have found coal from other districts as pure, there are few coals in which the sulphur is so low. The coal being coked in open clamps yields a coke with very little sulphur.

The limestone used is the Skipton mountain limestone, and has the following composition :—

	I.	II.	
Silica	·28	2·25	
Protoxide of iron	·36	·27	
Alumina	trace	trace	
Carbonate of lime	98·17	93·93	
Carbonate of magnesia	1·17	2·12	
Sulphur	·03	·21	sulphide of calcium.
Calcium	—	·26	
Moisture	·13	·19	
Organic matter	traces	·76	
Phosphoric acid	traces	nil	
	100·14	99·99	

I have carefully analysed the following numbers of pig iron made at the above works, and find it has the following composition :—

BOWLING PIG IRON.

	No. 1.	No. 2.	No. 3.	No. 4
Carbon, as graphite	3·421	3.155	3·361	3·308
Carbon, combined	·583	·581	·393	·319
Silicium	1·708	1·646	1·382	1·381
Iron	92·070	92.644	92·952	33,292
Manganese	1·606	1·472	1·475	1·169
Phosphorus	·630	·635	·602	·602
Sulphur	·073	·070	·063	·081
Titanium	traces	traces	traces	traces
	100 091	100·203	100·228	100.152

The above numbers were selected by the forge manager, and carefully marked as characteristic specimens; also two samples marked 3A known as "mingled metal," and 3B as "bull's eye," both being No. 3, sample 3B working with a tough cinder short of lime.

	3A.	3B.
Carbon, as graphite	3.196	3·177
Carbon, combined	·656	·447
Silicium	1·178	1·353
Iron	93·370	93·863
Manganese	1·241	1·190
Phosphorus	·612	·591
Sulphur	·071	·060
Titanium	traces	traces
	100·324	100·681

On comparing carefully the above analyses, it will be seen that the composition of the pig in the different numbers is practically identical, and the only difference apparent is a slight diminution in the percentage of silicon present. This diminution of the percentage of silicon is much more apparent in hot blast pig, as will be seen in the analyses of the second pig given below :—

PIG IRON, SEEND, WILTSHIRE.

	Silicium.	Sulphur.	Phosphorus.
No. 1	4·717	·036	·867
" 2	3·659	·077	·917
" 3	3·209	·096	·968
" 4	3·140	·196	·724
" 5	2·257	·160	·926
" 6	2·197	·248	·898

The results of the analyses of the Bowling pig would seem to confirm the opinion expressed by Mr. BELL in his paper "On some of the conditions that apparently affect the Quality of Iron," published in the Journal of the Iron and Steel Institute, November, 1871, page 288. He seems to think that the different qualities or numbers of iron are due to the influence of temperature, and that it is an error to suppose that the highly graphitic No. 1 iron contains more carbon than No. 3 or No. 4 iron, or even white pig. I quite agree with Mr. BELL as regards the carbon. In hematite pig it is frequently the case that No. 4 pig contains rather more carbon than No. 1. When the No. 1 pig is siliceous, the tendency of the silicium is to reduce the percentage of carbon.

HEMATITE PIG.

	A. No. 1.		B. No. 1.		C. No. 1.
Carbon, as graphite	2·548	3·805	3·173	4·269	—
Carbon, combined	·257		1·096	carbon	2·756
Silicium	3·294		1·660		3 705
Phosphorus	·044		·075		·053
Sulphur	·065		·071		·046
Iron	92·780		93·957		92·361
Manganese	·181		trace		·245
Titanium	—		·041		traces
	100·170		100.073		100·166

	D. No. 1.	E. No. 4.	White Pig.
Carbon, as graphite	4·186	3.858	3·13
Carbon, combined	—	—	
Silicium	1·817	2·234	·27
Phosphorus	·069	·073	·15
Sulphur	.035	·115	·54
Iron	93·754	93·444	95 83
Manganese	·250	·392	·16
	100·111	100·116	100 08

From the above analyses it will be seen that when the silicon is below 2 per cent. the carbon averages rather over 4·2 per cent.; when the silicon is over 3 per cent., the average of the carbon is only 3.8 per cent.

Before, however, accepting Mr. BELL'S views I think we ought to have more correct data to go upon as to the amount of sulphur in pig-iron. In the analyses given of the Seend pig, there is clearly a gradual increase in the percentage of sulphur with the numbers, except in the case of No. 4, which contains rather more sulphur than No. 5; it disagrees also with the other samples in containing rather less phosphorus, and may possibly have been produced under somewhat different conditions to the other samples.

In Welsh pig-iron I have also found that the percentage of sulphur always increases as the number or the quality of the pig decreases.

ANALYSIS OF SOUTH WALES PIG FROM CLAY IRONSTONES.

	GREY,	MOTTLED,	WHITE,	GREY.
Carbon	3·14	2·95	2·84	3 08
Silicon	2·16	1·96	1·21	2·22
Sulphur	·11	·28	·46	·09
Phosphorus	·63	·63	·64	·63
Iron	94·56	95 39	95·10	94·35
Manganese	·50	·23	·14	·23
Nickel and cobalt	·05	·04	·03	·07
	101·15	101·48	100·42	100 77

All cold-blast iron, except column 1, which was made with two tuyeres hot blast and one cold blast,

I am inclined to think that if our methods of determining sulphur were more trustworthy, we should find that slight differences in the amount of sulphur would explain the differences in the numbers or quality of the pig. Sulphur certainly does make grey iron white, and I see no reason why slightly different amounts of it should not modify the pig and produce the differences we find in it.

I am quite ready to admit that the different numbers in grey iron may be produced by differences in the rate of cooling. Take for example the case of Bowling pig. Practically there is a very great difference in the working of the four pigs marked, 3, 3A, 3B, and 4; they were analysed specially to discover this difference, but chemically speaking no difference is apparent. Are we then to assume it is due only to the different temperature at which they are produced?

When No. 3 pig is run from a Bowling furnace large quantities of sulphurous acid are given off, and I must say I am inclined to think that the quantity

retained by the pig may differ, and account for the difference in the pig.

With regard to grey cast-iron and white, the conclusions to be drawn from Mr. Bell's paper are as favorable to the view that sulphur causes the white iron, as that it is produced by difference in temperature. On referring to Mr. Bell's paper before alluded to, it will be found that three samples of No. 1 pig gave ·071, ·055, ·063 ; one of No. 3 pig gave ·108 ; two of No. 4 gave ·072, ·023, whereas in three samples of white iron ·199, ·209, and ·016 are given. The latter result, ·016, is certainly very low indeed for sulphur in a coke made white pig (refer to my analyses), very much lower than I ever found it in such pig.

Mr. Bell in his paper gives the carbon in white iron, so-called uncombined carbon (I presume from this that he considers it combined, or at any rate mostly so), and that the only method we have of determining the difference between combined and uncombined carbon is really of no value whatever. I have long considered that the determination of combined carbon is most unsatisfactory.

Since writing the above, I find Mr. Bell has made an experiment with white pig iron from the Clarence Iron Works, and clearly shows that by exposing it to an exceedingly high temperature, white pig iron becomes grey—No. 3 and No. 4.

In one experiment 60 lbs. of Clarence white pig was melted in a Siemen's steel melting furnace, and run into a mould of green sand forming a cube 6 in. on a side ; with the exception of a trace of white iron at one corner the whole mass was converted into uniform good grey forge.

The same quantity of the same iron was melted on a Saturday and allowed to remain over Sunday in the furnace, during which time it cooled slowly ; the block having a maximum diameter of six or seven inches, entirely grey, chiefly No. 3, interspersed with some No. 4.

It would be interesting to see if by exposure to so high a temperature there was any difference in the percentage of sulphur, and if some may not have been expelled from the white iron.

From the above experiments it is quite clear that by exposing white iron to a higher temperature it is converted into grey iron. Would No. 3 or 4 forge pig be converted into No. 1 pig by exposing it to a very high temperature alone? My impression is that it would not, unless it were heated with carbon, so as to separate the sulphur. I would suggest whether some practical process might not be used to convert hematite No. 4 pig into Bessemer No. 1 by heating at a high temperature with charcoal, No. 4 pig being produced so much cheaper, and without the wear and tear on the furnace that there is in making Bessemer pig.

TO BE CONTINUED.

Rail Specifications.

The following specifications for rails, issued by the German Railroad Union, show what the requirements in that country are.

"The rail top must consist of hard granular iron to a depth of at least ⅜ of an inch in the finished rail, and the rail base of soft fibrous iron not less than 9-16th inch thick. The bars laid between the top and bottom slabs must be of such quality as to weld well amongst each other, and to effect a gradual transition of the degree of welding heat, which is lowest in the top slab and highest in the bottom slab. (This clause excludes the use of old rails of uncertain quality.) All mill bars or flats, which are used in piling, must be rolled from hammered blooms. Top slabs, whether made from piles or solid blooms, must be hammered at full welding heat under a steam hammer not less than five tons falling weight; then reheated and rolled."

The specification for iron rails for Eastern Counties Railway, England, is as follows ; Rails to weigh 65 pounds per yard ; 80 per cent. to be 21 feet long, 15 per cent. 18 feet, and the remaining 5 per cent. 15 feet. Any rails which deviate from these lengths more than ⅛ of an inch will be rejected. The rails to be perfectly true and straight, of uniform section throughout, and the ends to be cut off square. Each rail to be marked on the side with the maker's name, and the date of the year when made. The rails are to be made from a pile 9 inches wide and 9 inches deep, consisting of one bar of iron 9×1¼ at the top and bottom. The intermediate bars not to exceed an inch in thickness, and to be alternately 6 inches and 3 inches wide, so as to break joint. The pile is to be rolled at a welding heat into a bloom 3 inches wide and 6 inches deep, which, being again raised to a welding heat, is to be rolled into a rail. The bars, 9" by 1¼", which form the top and bottom of the pile are to be manufactured from such a mixture of ores (being all mine iron) as shall produce the closest and hardest wrought iron, and shall be drawn from the puddle ball under a hammer which shall be equal to a 5-ton tilt hammer, into a slab 9 inches wide by two inches thick, which slab shall be heated sufficiently for its reduction to the required thickness of 1¼ inch. The bars of thickness not exceeding 1 inch for forming the central part of the pile are to be manufactured from such a mixture of ores (being all mine iron) as shall produce the closest and toughest wrought iron, and shall be drawn from the puddle ball under a hammer which shall be equal to a 5-ton tilt hammer, into a slab or bloom of convenient form, the sectional area of which shall be not less than 20 square inches, which slab or bloom shall be reheated sufficiently for its reduction into bars of the required thickness, not exceeding 1 inch. The use of cinder or cinder pig will not be permitted under any circumstances. The rails are to be dipped while hot in hot linseed oil, and are to be perfectly protected from the weather until this is done. Should any of the rails laminate, break, or otherwise fail, within a period of three years from completion of the order, the company will, at their own expense, take such rails out of the line, and the contractor shall be bound to exchange them for an equal quantity of sound rails, to be delivered when required, free of cost, at the company's grounds.

The reduction of the above pile in rolling is to be from an area of 81 square inches in the pile to an area of 6.8 square inches in the finished rail, or from an area of 12 to 1 very nearly.

The American Institute.

First on the left, in the department of machinery in motion, is Heald and Sisco's rotary pump which proves its powers by pouring a stream of water through a large pipe. Next to it are the machines of Andrews & Co., of which we spoke last week, and near by Pratt's steam pump which is not running. G. L. Cummings exhibits a large grindstone in a cast-iron tank, ready for placing in position. It is in an excellent mounting.

Alexander Stevenson's Fan Carpet Cleaning machine, which has already taken a premium from this Institute, occupies the end of the room, and we presume will soon be in motion. Near it stands an upright engine made by the Blanchard Steam Improvement Company, not yet cleaned or set up, but looking like a well-made affair.

Wright's Bucket Plunger Pump is a compact and solidly made machine, and evidently capable of good work in forcing liquids to unusual heights.

The Rogers Pump which stands next the above has a rocking motion. Both the steam and pump pistons consist of vanes which work through small arcs in circular chests. Steam is admitted both above and below the piston (on opposite vanes) at the same time, by which a short oscillatory or rocking motion is communicated to the steam piston. This motion is directly transferred to the water piston, which is a duplicate, on a larger scale, of the former. Hand pumps made on the same principle, and giving what appear to be advantages in handling, are also shown. This is a new pump, the last patent having been taken out this year. It can serve as a motor as well as pump, the rocking motion being transformed into revolving, by a fly wheel. In workmanship the machine appears well.

As we turn turn the corner of the transept, Wright's (of Newburgh) engine is found performing its usual duty of driving the machinery of the Fair. It is an 80 horse power engine of beautiful workmanship. Some changes in the mode of transmitting its power have been made, to which we shall refer hereafter.

In the transept the portable engines of the Yale Iron works occupy the first stand on the left. These engines show a solidity of make that might come into greater fashion with advantage to boiler users. They are of a type which is too well known to need description. Rawson & Hittinger exhibit a cogwheel hoisting engine, and near it are two rotary engines, Bennetts & Massey's. The latter machine is a large one, and it would be a comfort to some visitors to find it at times in motion. We believe the United States Government intends to make thorough tests of it next week, when we hope to return to its consideration.

Blake Brothers, New Haven, exhibit their new style stone breaker. The changes which have been made contribute materially to its simplicity. The toggle joint which gives this machine its enormous leverage is moved directly from the eccentric shaft, instead of from a lever as in the older forms. It has been found that this arrangement is sufficiently powerful as a crusher, and is much more convenient as a machine.

Eley's Sawmill fitted with Hoe's saw is in operation at the end of the room. The saw is well mounted, works smoothly and accurately.

The Erie City Iron Works also exhibit a saw mill carriage with the Eureka head block.

In the corner of the room stands Young's Reciprocrating Diamond Saw, for sawing stone. A broad blade of steel has, at certain intervals, pieces of soft steel placed in its edge, and projecting say three eighths of an inch. These contain black diamonds, usually three to each holder. As the saw is drawn over the surface of the stone the diamonds make a deep cut, but in the return stroke they are lifted clear of the stone. By this method the cuttings are all drawn gradually to one end, instead of being shoved back and forth in the cut. The machine does beautiful work. It leaves the surfaces free from saw marks and ready for the polishing stone. The edges are unbroken, and the stone, if for building purposes, is ready to set without further preparation. Specimens of its work in all kinds of stone are exhibited, with the time of sawing marked on them. They are indeed admirable pieces of work. This new use of the diamond is one that appears to have a bright future before it. It is noticeable that the diamond as a cutting instrument makes no headway outside of America. The diamond drill is hardly a subject of experiment in Europe. But here we have proved its value, while they are talking about the results being "still doubtful." With this new diamond tool in operation stone working in America will have facilities that may be of the greatest service in encouraging the increased employment of stone as a building material.

On a New Process for Utilizing Tinners' Clippings.

BY ADOLPH OTT, PH. D.

FROM every part of the country we learn that the price of iron is steadily increasing and that the rates have reached a figure unprecedented in the history of this metal. Although this state of things has been attained somewhat suddenly, there seems to be no prospect of stopping at this point. The conditions which caused the advance have since been intensified and there is no possibility of obtaining relief from abroad. The mills and founderies in England are taxed to the utmost, and have orders on hand which will take months to fill, the larger portion of which, as we understand, comes from the United States.

Notwithstanding this, large quantities of tinned

scrap iron are daily carted from the premises of tin-ware factories, much of it being used to fill up low lands and swamps. These clippings consist mostly of a superior kind of iron plate, and when completely freed from tin, would undoubtedly command the highest prices for scrap iron in the market. Unlike the ordinary scrap-iron of commerce, it is absolutely free from silicon, sulphur and phosphorus, and only contains so much carbon, as any good wrought iron should contain. As to the amount of this waste, which may be procured daily in New York City and vicinity, a thorough investigation has revealed the fact, that upwards of thirty tons may be depended upon, which is equal to about ten thousand tons per annum.

Since one ton of tin scrap, of 2000 lbs., contains on the average nineteen hundred pounds of iron and one hundred pounds of tin, ten thousand tons represent nine thousand five hundred tons of iron and five hundred tons of tin. If we estimate the iron at the low price of $40 per ton and the tin at $35 per hundred-weight, we obtain the enormous figure of $750,000, or a quarter less than one million dollars, represented in the scrap of one city by those two metals, *when separated from each other.*

It may be well imagined that the problem of the utilization of this waste has occupied the minds of inventors for many years past. That learned writer, distinguished as well by his erudition as by his social qualities, Professor VAN DER WEYDE, informs me that some fifty years ago, the society for the promotion of science and industry in Haarlem, Holland, promised a gold medal and premium in money to the chemist, who should invent a method for utilizing these refuse tin-scraps, which already then were accumulating and entirely useless; however, the attempt to stir up the chemists of that day had no result and after waiting many years in vain, the offer was withdrawn.

Last year attempts were made in this city to treat tin-scraps with chlorine gas, which, in uniting with the tin, forms bichloride of tin, a substance formerly largely used by dyers and calico-printers. However, as the tin is not entirely removed from the iron, those experiments have thus far resulted in failures. Moreover, no large quantities of the scraps can be treated at one time in this way.

It will be remembered by many that the writer of this is also the inventor of a process for the separation of the tin from the iron in tinner's clippings. Having been fully described in No. 18, Vol. XII., of THE ENGINEERING AND MINING JOURNAL, I do not consider it necessary to dwell upon it now; but I would remark that my process was in so far a scientific and commercial success, as by it over one hundred tons of scrap-tin were cleaned which were sold and paid for by horse-shoe manufacturers in Providence, R. I. The larger portion of the tin was also regained and sold. Owing, however, to the then low price of iron, and to the fact that the company, who controlled the patents, did not melt their tin, which was obtained as a precipitate, and a variety of other circumstances, the net profit (about $16 per ton) was smaller than anticipated.

The small capital invested ($10,000), scarcely sufficient to defray the cost of the apparatus, was eaten up by high salaries, paid to merely ornamental officials, long before real work was commenced. Thus, the company was left without working capital. Notwithstanding this, the high salaries were kept up, improvements recommended by me, which might have saved a considerable outlay for labor, were left unaccomplished; in short, all attempts to infuse new life into the company were frustrated by the incompetency of its directors, and, we may as well confess it—by an empty treasury. And, to crown everything, quarrels arose between the president and the stockholders, so that the liquidation of the company was foreshadowed long before it toook place.

But the ill-success of that company did not prevent others from re-entering the same field of industry.

The new process and apparatus in question are covered by three patents, dated March 26, 1872, June 18 and 25, 1872. They were secured by Mr. THOS. F. WELLS, of this city. The process is described as follows:

"The tin scraps are first treated with hydrochloric acid of 22° Baumé, till the bath is exhausted; 2 to 3 per cent. of nitric acid and from 1 to 1½ per cent. (of the amount of hydrochloric acid) of chlorate of potash is then added, which, in a measure, regenerates the bath, so that 500 lbs. of hydrochloric acid, instead of the 1,000 lbs. formerly required, will suffice to treat one ton of scraps."

The chemistry of the operation may be explained substantially as follows: The nitric acid serves to form an oxide (protoxide of tin) which is more readily soluble in weak hydrochloric acid than metallic tin. As to the addition of chlorate of potash, it serves to prevent the precipitation of hydrated oxide of tin, which would be lost in the process, since it would fall down at the end of the operation, viz.: if formed in a saturated, scarcely acid solution."

"With regard to the practical working of the process, the clippings are filled in a trommel or drum of a cylindrical shape, which may either consist entirely of copper, or of a metal frame, in combination with adjustable, perforated plates of glass or similar material. Such a drum, when having a diameter of about six feet and a length of five feet, will hold from 1,000 to 1,200 lbs. of scraps. It is provided with a folding door of suitable construction, for the purpose of charging and discharging it, and is made to rotate on a horizontal shaft of copper, which may be continuous or merely attached to the outside of the heads. This drum is made to revolve successively in several vats or tanks, which are charged with the liquors used in the process, it being transferred from one bearing to another by means of a truck running on an elevated tramway, and rotated by means of shafting set in motion by a steam engine or other power used to operate the machinery."

"The first vat or tank, which is made of strong wood and lined with glass plates, is filled with hydrochloric acid almost to the rim. As soon as the tin is dissolved, the drum is lifted out from the acid vat and inserted into another filled with water, in which it is rotated for several minutes. From this bath, it is again lifted out to be inserted into and rotated in a second water tank, in order that the iron-scraps may be completely freed from acid. Finally the drum is rotated in a fourth vat containin ga weak solution of silicate of soda (soluble glass). This solution is used in order that the scrap-iron may not be liable to rust.

From the experiments of the inventor and patentee, Mr. THOS. F. WELLS, it is found, that the length of time for dissolving the tin from the iron increases with every new charge inserted, from five to ten minutes. When it requires one hour to treat a charge properly, nitric acid with chlorate of potash are gradually stirred into the bath. This being done, the bath acquires new strength, as it were, so that an equal amount of clippings to that first treated, can now be treated in the regenerated bath. The saving incurred by the addition of these chemicals amounts to over 500 lbs. of hydrochloric acid per ton of clippings.

As regards the time to treat one charge, it averages one hour and fifteen minutes.

When the liquor in the first vat will not dissolve any more tin, it is drawn off into another vat, placed below. The tin is precipitated by spelter as metallic tin ready for melting.

There remains in solution chloride of zinc and chloride of iron, which is available for the preparation of paints, or as a disinfectant, or for the preservation of timber.

With regard to the novel features of this process, they may be summed up in the following:

1. The saving of about five hundred pounds of hydrochloric acid per ton of clippings.

2. The saving of at least ten per cent. of the waste in manufacturing the iron obtained, by treating it with soluble glass to prevent rusting.

3. The employment of the remaining liquor for useful purposes.

4. The saving in labor by improved machinery.

Regarding the cost of this new process, those who have examined the question are convinced that it does not exceed $29 05 per ton, the receipts are estimated at $83 50 per ton, and are thoroughly reasonable.

Treating 10 tons each day leaves a profit of					$544.50
"	15	"	"	"	" 816.75
"	20	"	"	"	" 1,089.00
"	30	"	"	"	" 1,633.50

The patents referred to are controlled by a newly organized company—the Manhattan Metal and Chemical Company, 41 Pine street, New York, whose intention it is to construct their works of a capacity sufficient to treat thirty tons daily.

The process has been thoroughly examined and is favorably reported upon by the following gentlemen: Mr. THOS. J. BARRON, inventor of the celebrated Barron process for making steel; Mr. WILL. L. FABER, metallurgist and mining engineer, graduate of the School of Mines in Freiberg, Germany, and Professor P. H. VAN DER WEYDE, editor of the *Manufacturer & Builder.*

The company have at their offices specimens of their products which they are ready to show to those who take an interest in the subject.

Meteoric Iron.

Three specimens were exhibited of meteoric iron from Augusta County, Virginia. Of these, the first had been cut from the original mass by a planing machine, and, without further preparation, had been forged into a tolerably perfect blade for a paper-knife. The second had been heated to strong redness in a porcelain tube rendered vacuous by a Sprengel pump (for the purpose of examining the occluded gases), and had then been with much difficulty forged into a blade of similar kind, in which cracks and flaws were visible. The third had been heated in like manner *in vacuo*, but to a white heat; and this specimen, it was found, could not be forged at all, crumbling under the hammer when re-heated.

The conceivable causes of these differences were briefly discussed, such as the more or less complete removal of the occluded gases, changed state of combination of the phosphorous (and sulphur), and melting out of phosphide of iron leaving the iron porous.

A NEW rail mill has gone into operation at Columbus, Ohio. It has now fourteen puddling furnaces, eight heating furnaces, and twenty-two steam boilers. On "double turn" the capacity of the mill is about one hundred and sixty tons a day, requiring the labor of some two hundred and fifty men. The engine has a thirty-inch cylinder, thirty-six feet stroke, and a fly-wheel twenty-four feet in diameter, weighing thirty-two tons. This mill is to be used at present solely for making railroad iron, but has sufficient power to roll steel rails, if the company, in the course of time, should choose to erect the furnaces necessary for their manufacture.

One of the funniest manifestations of amateur metallurgists is their nomenclature. A contemporary announces that "The lead mines at Lead Hill, Ark., have two *extricating* furnaces in operation, turning out four tons a month of lead from surface minerals taken from the immediate surface, averaging as high as 80 per cent. pure lead." The editor probably imagines that lead bars are to be found in a mine like a needle in a haystack, and that a furnace is a kind of winnowing machine. The whole paragraph is good. Probably the smelter ascertains the presence of lead in his hearth by a microscope, since at two tons a month he would get only about 8 pounds an hour.

THE COAL TRADE.

NEW YORK, Sept. 27th, 1872.

Anthracite Coal.

The excitement in the trade keeps up in prospect of the general rise in prices which is to take place on the first of the month, and in their hurry to obtain all possible advantage from this, dealers give the appearance of a heavier trade than really exists. But the market does not need artificial stimulus, of this or any other kind. There is a strong demand for all house coals, and dealers are feeling the pressure of the call for Fall supplies. This is one of the branches of the trade which will experience the greatest rise, and on the 1st of October prices to city dealers will be probably 75 cents higher.

Advances have been or will be made before next Tuesday, on all sides. The Scranton sale showed an average rise of nearly 59 cents as follows:

	September.	August.	Advance.
Lump	$3 66½	$3 17½	49c
Steamer	4 16½	3 20	96½
Broken	3 87½	3 40	47½
Egg	4 04½	3 44	60½
Stove	4 30½	3 77½	52½
Chestnut	3 70½	3 24½	46
			58½

The Lehigh Coal Exchange made the following prices September 25:

		Advance.
Lump	$5 00	none
Broken	4 60	55c.
Egg	4 60	35
Stove	4 80	30
Chestnut	4 00	none

Line prices on Lehigh have been advanced 25 cents a ton. The price list at Mauch Chunk stands as follows:

Lump	$3 25
Steamer	3 25
Broken	3 25
Egg	3 50
Stove	3 00

It will be seen from these figures that much caution has been used in carrying up prices, the lesson of last October being fresh in mind. There is on every hand a determination to avoid a misstep, and propositions for more decided steps are discouraged. Still it is probable that the rates will again go up. The prices obtained at the Scranton sale seem to warrant more decided measures than the cautious feeling among dealers has permitted the companies to take. The briskness of the trade and the promise of an active month will also have their effect. Indeed we believe a positive move for a greater advance has already taken place, though it is not looked upon with favor at present by those who want to see the present hopeful activity maintained. So far this year we have managed to get rid of 14,850,000 tons of Anthracite or nearly three millions more than last year, and the condition of the trade during the summer proves that this has not been done by laying in unusual stocks. Demand has greatly increased and will continue large.

The Bituminous Trade.

The Bituminous men, not to be behind their "hard" brethren, have made their little combination too. We should rather say they have made their great combination, for one of the beauties of this branch of the coal business is the delightful unity in which its members dwell. The companies—all of them we believe—meet to-day to decide how much they can advance their rates, and if they come to a conclusion, we hope to announce it before going to press. Business is good, especially in view of the rise. As in Anthracite there is a sound, as well as a stimulated activity, and the call for coal is very satisfactory.

A new feature has been introduced into the coal trade. Numbers of "options" have lately been purchased, the buyer paying a certain sum for the privilege of taking coal hereafter at present prices. We believe considerable quantites of coal have been lately sold in this way.

September 28.

The subject of advanced rates was yesterday referred to a committee who will report to-day. All that is known is that a decided rise will take place on the first of October.

Bituminous Coal Trade, 1871 and 1872.

The following table exhibits the quantity of Bituminous Coal passing over the following routes of Transportation for the week ending Sept., 21, 1872, compared with week ending Sept. 23, 1871.

COMPANIES	1871. Week.	1871. Year.	1872. Week.	1872. Year.
C. & O. Canal	17,578	498,459	15,277	468,062
B. & O. R. R.	26,277	905.837	25,772	901,060
H. & B. T. R. R.	4,472	235,409	4,999	217,841
*Harrisburg & D.	8,158	405,272	10,591	369,780
*L. V. R. R.	6,236	291,026	468	21,782
P. & N.Y.C. & R. Co.	....	.....	7,320	277,083
Cumberl'd Branch Canal	5,237	147,436	6 384	160 639
" Railroad	683	52,322	278	13,265
Total	68,641	2,535,761	71,089	2,429,512
		2,429,512	68,641	
Decrease		106,249		
Increase			2,448	

Anthracite Coal Trade for 1871 and 1872.

The following table exhibits the quantity of Anthracite Coal passing over the following routes of transportation for the week ending Sept. 21, 1872, compared with the week ending Sept. 23, 1871.

COMPANIES.	1871. WEEK.	1871. TOTAL.	1872. WEEK.	1872. TOTAL.
*Phila & Reading R. R†	150,963	3,887,758	124,689	4,135,470
Schuylkill Canal	13,382	702,340	19,329	603,344
*Lehigh Valley R. R.	75,632	1,544,953	55,700	2,434,521
Lehigh & Sus. R. R.	32,014	852,038	38,101	1,261.714
Lehigh Canal	32,715	445,947	22,821	549.843
Scranton North	19,694	335,926	21,901	531,514
" South	29,042	745 695	39,645	1,549,034
Penn. Coal Co., rail	23,545	453,340	25,480	863,245
" " " canal	361	9 506	482	4,557
Del. & Hud. Canal Co.	37.866	653,581	46,598	1,037,163
" East	9,419	217,818	10,212	432,588
" " West	4,572	73,780	8,716	283,702
" " South	9,042	206.425	9,638	279,036
Shamokin	11,638	463,581	11,106	396,420
Trevorton	....	....	....	....
Lykens Valley Coal Co.	2,132	67,745	..	2,085
Wyoming North	....	.....	....	....
Wyoming South	....	.....	....	....
P. N. Y. C. & R. R. Co.	....	104,987	12,150	464,261
Williamstown Col'y	....	....	....	....
Big Lick Col	3,254	106,664	....	10,591
Total	468,311	10,872,480	446,598	14,842,118
1870	476,598			10,872,480
Increase				3,969,638
Decrease	18,713			

* These figures are for the week and fiscal period commencing Nov. 30

†Less coal transported for Co's use and Bituminous coal.

Philadelphia & Reading Railroad and Branches.

COAL TONNAGE

For the Week ending Saturday, Sept. 21, 1872.

BY RAILROAD.—ANTHRACITE.

PASSING OVER MAIN LINE AND LEB. VAL. BRANCH.

	Tons. Cwt.
From St. Clair	31,012 16
" Port Carbon	5,945 03
" Pottsville	2,917 15
" Schuylkill Haven	22,706 16
" Pine Grove	5,161 15
" Tamaqua	15,359 15
" Harrisburg	27 09
" Dauphin	6,997 15
Total	90,129 04

FOR SHIPMENT BY CANAL.

Passing Frackville Scales	6,422 16
" Mill Creek "	1,806 01
" Schuylkill Valley Scales	360 19
" Mt. Carbon "	1,486 05
" Cressona "	8,417 02
" Pine Grove "	
" Tamaqua "	1,173 12
Total	19,666 15

SHIPPED WESTWARD VIA NORTHERN CENTRAL RAILROAD.

Passing Locust Gap	1,375 08
" Shamokin	5,262 08
" Herndon	.....
Total	6,637 16

SHIPPED WEST OR SOUTH FROM PINE GROVE.

Via Schuylkill & Susquehanna R. R.	796 07
" Lebanon & Pine Grove Branch	1,145 17
Total	1,942 04

CONSUMED ON LATERALS.

From Frackville Scales	511 03
" Mill Creek "	419 08
" Schuylkill Valley Scales	1,109 08
" Mt. Carbon "	1,073 16
" Cressona "	221 06
" Pine Grove "	45 19
" Tamaqua "	1,100 04
Total	4,481 04

LEHIGH AND WYOMING COAL.

Received via Allentown, E. Penn'a Br.	21 18
" " Alburtis, "	75 10
" " Oreland, G. & N. Br.	1,157 18
" " Connecting R. R.	.....
" " Willow Street R. R.	625 02
Total	1,831 08

BITUMINOUS.

From Harrisburg	10,580 13
" Connecting R. R., G. & N. Br.	
" Junction R. R.	10 00
Total	10,590 13

COAL FOR COMPANY'S USE.

Anthracite	4,987 07
Bituminous	307 14
Total	5,295 01

RECAPITULATION.

	Total for Week.	Corres-p'g week last year.	Increase and Decrease.
Passing over Main Line and Leh. Val. Branch	90,129 04	107,665 18	d 17,536 14
For Shipment by Canal	19,666 15	30,512 00	d 10,845 05
Shipped Westward via Northern Central R. R.	6,637 16	4,842 05	i 1,795 11
Shipped West or South from Pine Grove	1,942 04	2,378 13	d 436 09
Consumed on Laterals	4,481 04	3,990 08	i 590 16
Lehigh and Wyoming Coal	1,831 08	1,673 01	i 158 07
Total Anthracite paying freig't	124,688 11	150,962 05	d 26,273 14
Bituminous	10,590 13	8,157 10	i 2,433 03
Total of all kinds paying freig't	135,279 04	159,119 15	d 23,840 11
Coal for Company's use	5,295 01	4,127 13	i 1,167 08
Total Tonnage for Week	140,574 05	163,247 08	d 22,673 03
Previously this year	4585377 16	4304197 05	i 281,180 11
Total to date	4725952 01	4467444 13	i 258,507 08

SHIPPED BY CANAL.

From Schuylkill Haven	18,238 13	29,970 00	d 11,731 10
" Port Clinton	1,090 00	3,086 00	d 1,996 00
Total Tonnage per Week	19.328 10	33,056 00	d 13,727 10
Previously this year	584,015 15	681,137 12	d 97,121 17
Total to date	603,344 05	714,193 12	d 110,849 07

Report of Coal Transported over Lehigh Valley Railroad

Report of coal tonnage for the week ending Sept. 21, 1872, with totals to date, compared with same time last year.

WHERE SHIPPED FROM.	WEEK. Tons. Cwt.	TOTAL. Tons. Cwt.
Total Wyoming	9,442 05	415.275 04
" Hazleton	46,615 04	1,761.036 19
" Upper Lehigh	6 03	2,139 05
" Beaver Meadow	15,711 16	608.974 13
" Mahanoy	4,326 19	302,096 17
" Mauch Chunk	16 12	2.389 15
Total	76,129 02	3,091,962 13
Same time last year	100,019 19	1,924,861 16
Increase		
Decrease	23,890 17	1,167,100 17
Forwarded East from Mauch Chunk by rail	55,790 09	2,434,541 03
Same time last year	75,632 05	1,544,958 16
Increase		889,562 07
Decrease	19,841 16	

DISTRIBUTED AS FOLLOWS.

Forwarded East from Mauch Chunk by rail	55,027 11	2,336,880 09
do East for use L. V. R. R.	762 18	37,640 14
Delivered at and above Mauch Chunk for use of L. V. R. R.	978 04	45.916 02
To P. & N. Y. R. R.	8,493 00	287,049 03
To N. C. R. R., at Mount Carmel		1,952 05
To D. H. & W. R. R.	862 15	24,444 00
To L. & S. R. R. at Packerton for rail	209 13	10,266 00
Delivered at M'h Chunk	44 02	1,369 18
Delivered on line of road above Mauch Chunk	252 00	12,631 04
To L. S. & R. R., at Penn Hav., for railroad	6,415 16	4,001 09
Do. for canal		172,133 15
To Lehigh Canal Mauch Chunk	3,083 03	89,991 18
To Catawissa Railroad		9,625 16
Total	76,129 02	3.091,962 13

Report of Coal Transported over Central R.R. of N. J. (Lehigh and Susq. Div.)

Week ending September 21—Compared with same time last year.

WHERE SHIPPED FROM	WEEK 1872., tons ct.	WEEK 1871., tons ct.	YEAR 1872 tons cwt.	YEAR 1871. tons. cwt.
Wyoming Region	38807 15	30970 14	1074798 09	880453 07
Upper Lehigh Region	4430 10	4559 03	145251 16	56701 04
Beaver Meadow Region				
Hazleton Region	6588 14	11257 11	179228 03	115652 11
Mahanoy Region				
Tresckow Region	4700 05	3697 00	111313 13	41420 13
Mauch Chunk Region	9668 14	6775 19	325064 14	142890 06
Totals	61195 08	57260 07	1835656 15	1237094 01
Increase	3935 01		598562 14	
Decrease				
DISTRIBUTION.				
Forwarded East of Mch Chunk by Rail	38107 07	32014 07	1261714 05	852098 04
Forwarded East of Mch Chunk by Canal	15762 15	19469 16	355496 07	253783 05
Delivered at and above Mauch Chunk	1641 01	1503 08	42660 07	42697 08
L. V. R. R at Packer'n	153 17	636 05	10435 16	24195 09
Delivered to L. & B. R. R. at Plymouth Bridge	5530 09	3639 11	165351 00	64319 15
Totals				
Of the above there was transported on acc'nt of L. C. & N. Co	16279 13	10907 04	474276 16	276140 10
W.-B. C. & I. Co	23132 09	18017 01	726626 06	611549 16
Totals	39412 02	28924 05	1200853 02	816690 06
Increase	10487 17		384162 16	
Decrease				

Statement of Coal Transported over Cumberland and Pennsylvania Railroad

During the week ending Saturday Sept. 21. and during the year 1872, compared with the corresponding period of 1871.

WEEK.

	To C. & O. Canal Tons. Cwt.	To B. & O. R. R. C. Tons. Cwt	Total. Tons Cwt.
1872	15,276 18	25,771 16	41.048 14
1871	17,577 13	26,277 08	43,855 01
Increase			
Decrease	2,300 15	505 12	2,806 07

YEAR.

1872	468.061 19	901,060 02	1,369,122 01
1871	498,459 06	905,836 11	1,404,295 17
Increase	....		
Decrease	30.397 07	4,776 09	35,173 16

Cumberland Branch R. R.

WEEK.

	To C. & O. Canal. Tons. Cwt.	To P. & O. R. R. Co Tons. Cwt.	Total. Tons. Cwt.
1872	6,384 06	278 07	6,662 13
1871	5,276 15	683 00	5.919 15
Increase	1,147 11		742 18
Decrease	.....	404 13	

YEAR.

1872	160,638 17	13,265 06	173.904103
1871	147.436 01	52,321 16	199,757-17
Increase	13,202 16		
Decrease		39,056 10	25,853 14

Lehigh Canal Coal Trade.

Shipped for the week ending September 20, 1872.

	Week. Tons. Cwt.	Week. Tons. Cwt.
Total from Mauch Chunk Region	7,584 10	181,414 08
" " Beaver Meadow "	4,076 07	111,771 00
" " Mahanoy "	375 06	8,053 03
" " Hazleton "	6,415 16	171,667 08
" " Upper Lehigh "	685 02	21,210 01
" " Wyoming "	3,683 16	55,727 12
Total	22,820 17	549,842 12
Corresponding week last year	32,774 12	445,946 19
Increase	.....	103,895 13
Decrease	9,953 15	

Delaware and Hudson Canal Company.

The following is a statement of Coal Transported by the Delaware and Hudson Canal Co. for the week ending Sept. 21, 1872.

	FOR THE WEEK.	FOR THE SEASON.
By Delaware and Hudson Canal,	44,598	1,037,163
By Railroad, East	10 212	432 588
" " West	8 716	283 702
" " South	9,698	279,036
Total Tons	75,224	2,032,489

For the same period last year.

	FOR THE WEEK.	FOR THE SEASON.
By Delaware and Hudson Canal,	37,966	653,581
By Railroad, East	9,419	217,818
" " West	4 572	73.780
" " South	9,042	206,455
Total Tons	60,899	1,151,634
Increase	890,855	

Delaware Lackawanna & Western Rail Road Company.

Coal transported on the Delaware, Lackawanna, & Western Railroad for the week ending Saturday, Sept. 21, 1872.

	WEEK. Tons. Cwt.	YEAR. Tons. Cwt.
Shipped North	21,901 10	534,544 08
Shipped South	39,645 10	1,549,034 00
Total	61,547 00	2,083,578 08
For the Corresponding time last Year :		
Shipped North	19,694 06	335,926 08
Shipped South	39,042 08	745,694 16
Total	58,736 14	1,081 621 04
Increase		1,001,957 04
Decrease	2,810 06	

Schuylkill Canal.

Report of coal transported over the Schuylkill Canal for the week ending Saturday, September 21, 1872.

	Tons. Cwt.
From Schuylkill Haven	18,738 10
" Port Clinton	1,190 00
Total for week	19 928 10
Previously this year	584,015 15
Total	603,344 05
To same time last year	702,339 12

Pennsylvania Coal Company.

Shipments of Pittston Coal for the week ending September 21, 1872.

	1872. WEEK.	1872. YEAR.	1871. WEEK.	1871. YEAR
By Railway	25,449 16	861 245 04	23,545 04	453,34 04
" Canal	481 14	4,457 06	360 11	9.5.6 09
Total	25,931 10	867,802 10	23,905 15	462,846 13
Increase 1872	404 955 17			

Northern Central Railway, Shamokin Division.

Below is the return of Coal sent over the Shamokin Division of the N. C. R. W., for the week ending September 21, 1872.

	Tons. Cwt.
East	1,791 11
West	9,314 03
	11.105 14
Same time last year	11,637 15
Increase	
Decrease	532 01
Total amount shipped to date	396,220 05
Same time last year	463 881 03
Decrease	67,460 18
Increase	

Delaware and Hudson Canal Company.

Coal mined and forwarded by the Delaware and Hudson Canal Company for the week ending Saturday, September 21, 1872.

	WEEK.	SEASON.
North	51,318 12	1,866,250 04
South	9,697 15	279 936 00
Total 1872	61,016 07	2,145,286 04
Corresponding time in 1871 :		
North	52 948 00	994,419 00
South	9,042 05	206,454 19
Total	61,990 05	1,155,873 19
Increase North		
Decrease North		
Increase South		
Decrease South		
Total increase 1872		989,412 05
Total decrease 1872	973 18	

Prices of Coal by the Cargo.

[CORRECTED WEEKLY.]

	AT NEW YORK. September 27. R. A.	W. A.	AT PHILADELPHIA. September 27. R. A.	W. A.
SCHUYLKILL.				
Lump	$— —	$— —	— —	
Steamer	— —	— —	— —	— —
Broken	— —	— —	— —	
Egg	5 25	4 75	— —	— —
Stove	5 50	5 00	— —	— —
Chestnut	4 25	—	— —	
Pea	— —	— —	— —	— —
LEHIGH.				
Lump, (along side)	5 35	—	— —	— —
Broken	4 60	— —	— —	— —
Egg	4 60	— —	— —	— —
Stove	4 85	— —	— —	— —
Chestnut	4 35	— —	— —	— —
Pea	— —	— —	— —	—
SPECIAL COALS				
Honey Brook, Le'h	W.A. 4 00@5 00		— —	— —
Spring Mountain	" "	— —@— —	— —	— —
Sugar Creek	" "	— —@— —	— —	— —
Sugar Loaf	" "	— —@— —	— —	— —
Old Comp'n's	" "	4 00@5 15	— —	— —
Room Run	" "	4 00@4 50	— —	— —
McNeal	" "	— —	— —	— —
Girardville	" "		3 10@4 00	— —
Hill & Harris	" "	— —	— —	— —
Shamokin	" "	— —	— —	— —
Lykens Valley	" "	— —	— —	— —
Broad Top	" "	— —	— —	— —
McMichael	" "	— —	3 25@4 25	— —
Henry Clay	"	— —	— —	— —
Powelton	"	— —	— —	— —

Company Coals.

September, 1872.

	L.	Str.	Gra.	Eg.	Sto	Chest
*Scranton at E. Port	3 45	3 45	3 65	3 70	4 00	3 50
*Pittston at Newburg	3 80	3 80	3 80	3 80	4 00	3 80
*Lackawana at Weehawken	3 50	3 50	3 50	3 70	4 00	3 60
Wilk'b're at Hoboken	3 60	3 65	3 95	3 85	4 10	3 60
Old Co. Lehigh at PtJohn'n	5 25	—	4 50	4 60	4 80	4 00
Lehigh at Eliz. Port	5 00	—	4 60	4 60	4 80	4 00

For freights to different points see "Freights."
To contractors only.

Prices at Baltimore—September, 1872.

Wholesale Prices to Trade.

Wilksbarre, by cargo or car load	$4 60@4 85
Pittston and Plymouth, do	4 60
Shamokin Red or White Ash, do	4 75
Lykens Valley Red Ash, do	5 50
Zerba Valley	
Treverton	
By retail, all kinds per ton of 2,240 lbs	6 50@7 50
George's Creek and Cumberland f. o. b. at Locust Point for cargoes	4 60@4 65
Fairmont and Clarksburg gas f. o. b. at L. Point	6 00
BITUMINOUS COALS.	
Kittaning Coal Co.'s Phœnix Vein, f. o. b. at Phila	$
Lemon " " "	
Cumberland Vein Coal	
Consolidation Coal Co.'s on board	N. Y.
Maryland Coal Co	"

Prices at Georgetown, D.C., and Alexandria, Va.

September, 1872.

George's Creek and Cumberland f. o. b. for shipping	$4 20@4 35

Prices at Havre de Grace, Md.

September, 1872.

Wilkesbarre and other White Ash for Cargoes	$4 25@4 50
Lykens Valley	@5 50
Shamokin Red or White Ash	4 25@4 50

Bituminous Coals (Cumberland).

Georgetown, F.o.b	$4.25
Baltimore	4.50
New York	6.60

Prices of Gas Coals.

September, 1872.

PROVINCIAL.

Corrected weekly by Louis J. Bellioni, Jr., 41-43 Pine st., N. Y.

	Coarse	Slack.
Block House	$1 60	$— 75
Gowrie	1 60	— 75

Vessels are being chartered at $3 00 to $3 25.

Corrected by Bird, Perkins & Job, 27 South street.

	Coarse	Culm of Coal,
Pictou	$2 25	1 25
Sydney	2 25	- 80
Lingan	1 60	- 80
Caledonia	1 60	- 80

A discount from the prices of the coarse Coal on purchase of 5000 tons and upwards. Duty on all slack coal or Culm : 40c. per ton of 28 bushels, 80 pounds to the bushel. On all bituminous coal or shale: 75 cents per ton of 28 bushels.

AMERICAN.

	Currency.
Westmoreland	$7 10 @— —
Fairmount Gas Coal Co. of N. Y.	7 00 @— —
Dispard Coal Co	7 00 @— —
Penn	7 10 @— —
Newburg Orrel Gas	— — @— —
West Fairmount Gas Coal	7 00 @— —
AT PHILADELPHIA.	
Westmoreland	7 00 @— —

Prices of Foreign Coals.

September, 1872.
Duty 75 c. per ton.

Corrected weekly by ALFRED FARMELE, No. 32 Pine street, N. Y.

Liverpool Gas Caking	$ 8 00@— —
" " Cannel	12 00@13 00
" House "	19 00@20 00
" Orrel	14 00@16 00

Per ton 2,240 lbs., ex-ship

PRICES FROM YARD.

Liverpool House Orrel, screened	$14 00@16 00
"Cannel, "	19 00@23 00

Per ton 2,000 lbs. delivered.

Rates of Transportation to Tide Water.

BY RAILROAD.

TO PORT RICHMOND, PHILADELPHIA.

Philadelphia and Reading Railroad, from Schuylkill Haven for consumption ($1 85 less 55c drawback	$1 30
For reshipment	1 75

MAUCH CHUNK TO ELIZABETHPORT.

L. V. Railroad from Mauch Chunk to Phillipsburgh	$0 66
C. R. R., N. J., Phillipsburgh to Elizabethport	0 98
Shipping expenses at Elizabethport	25
Wharfage	10
Total	$1 99

MAUCH CHUNK TO PORT JOHNSON.

L. V. R.R., or L. & S. R.R. from M. C. to Phillipsb'g	$0 66
C. R. R., of N. J., Phillipsburgh to Pt. Johnson	0 98
Shipping expenses	25
Wharfage	
Total	$1 99

TO HOBOKEN

L. V. R. R., Mauch Chunk to Phillipsburgh	66
Morris & Essex R. R. Phillipsburgh to Hoboken	0 98
Shipping expenses	25
Wharfage	10
Total	$1 99

TO SOUTH AMBOY.

L. V. R. R.	66
B. & D. R. R. / Cam. & Am R. R.	93
Shipping Expenses	3
Total	$ 199

PENN HAVEN TO ELIZABETHPORT.

L. V. R R. Penn Haven to Phillipsburgh	0 7
C. RR. of N. J. Phillipsburgh to Elizabethport	0 98
Shipping expenses	25
Wharfage	10
Total	$2 11

Foreign and Provincial Freights.

September 1872.

Foreign.

Newcastle and Ports on Tyne, per keel of 21 1-5 tons £
Liverpool, 5 per cent primage

TO NEW YORK.

Provincial

Sydney	$3 05
Lingan	3 50
Cow Bay	3 75
Port Caledonia	3 10
Little Glace Bay	3 00

TO BOSTON.

Sydney	3 00
Lingan	3 00
Cow Bay	3 00
Port Caledonia	3 00
Little Glace Bay	2 90

Freights.—September, 1872.

TO EASTERN PORTS.	Cumberland. From Georgetown.	Cumberland. From Baltimore	Anthracite. From Philadelphia.	From Elizabethport, Port Johnson, and Hoboken.	From Newburgh.	From Rondout.
Amesbury						
Bangor		2 80		1 80	2 00	
Bath	2 60	2 60				
Boston	2 50	2 60		1 80	2 00	2 25
Bridgeport	2 25	2 35		1 00	1 20	1 25
Bristol				1 40	1 60	1 70
Cohasset Narrows	2 60					
Derby	2 30			1 25	1 35	
Dighton	2 35			1 45	1 65	
East Cambridge				1 80	2 00	
Fall River	2 40	2 35		1 40	1 60	1 70
Hackensack	2 25					
Hartford		3 00		1 60	1 65	1 75
Hoboken	1 90			60		
Jersey City	1 90			60		
Lynn					2 00	
Middletown				1 35		
Mystic	2 60	2 75		1 30	1 35	
New Bedford	2 30	2 35		1 45	1 65	1 75
Newburyport	2 45	2 80		1 95	2 15	2 25
New Haven	2 25	2 30		1 00	1 20	1 25
New London	2 25	2 35		1 20	1 40	1 50
Newport	2 25	1 90		1 40	1 60	1 70
New York	2 05	1 90		60	60	65
Norwalk	2 50	2 50		1 00	1 20	1 75
Norwich	2 30	2 50		1 30	1 50	1 60
Pawtucket	2 35	2 70		1 50	1 70	1 85
Portland	2 55	2 75		1 75		
Portsmouth, N.H	2 70	2 90		1 90	2 15	2 25
Providence	2 25	2 35		1 40	1 60	1 75
Rockport						
Saco						
Sag Harbor	2 85	3 00		1 30	1 40	
Salem	2 50	2 65		1 85	2 00	2 15
Stamford				1 00	1 20	
Stonington				1 30	1 35	1 45
Taunton				1 90		
Warren				1 40	1 65	
TO RIVER PORTS						
Albany	3 00	2 40				
Catskill						
Cockaackie						
Coeyman's						
Cold Spring	2 30	2 25				
Fishkill						
Haverstraw	2					
Hudson	2 30	2 30				
New York						
Nyack	2 25					
Poughkeepsie	2 25					
Rhinebeck						
Rondout						
Saugerties						
Sing Sing						
Stuyvesant						
Tarrytown						
Troy	3 00	2 50				
West Point						
Yonkers						

MARKET REVIEW.

NEW YORK, Sept. 25, 1872.

IRON—There is very little change to note in Scotch Pig, the market continuing firm for all brands. There is but little Eglinton to be had outside of one holder, and the same may be said of Glengarnock. Coltness is also in light stock, and is held at full prices. We have only to note sales of 100 tons Eglinton from yard, and 100 d°. Glengarnock, both on private terms. We quote Eglinton $52,50a53, Glengarnock $54a55, Gartsherrie $56a57, and Coltness $60. American continues firm. Some mills are still behind hand in their deliveries, and full prices are realized for any lots that may be obtainable; 100 No.2 ex Thomas, sold at $54, and 100 tons No. 1 Poughkeepsie, $54,50. We quote No. 1 $55a57. No. 2 $53a54, and Gray Forge $48. Rails are quiet (but perhaps a shade firmer) at $75 gold for New English, and $85a90 currency for American, for present and future delivery at the mills in Pennsylvania. 1500 tons new English sold at $75, cash. Old English may be quoted $47a48 gold, with sales of 1000 tons T., delivered at Philadelphia, at $55 currency. Scrap is very dull, and the market is weak at about $45a46 from dock, and $47a50 from yard; the stock at the present time is estimated to be about 6a8000 tons, the largest known for several years past; sales 3a400 tons, part to arrive, on terms not made public, but part at lower figures than our quotations. Refined Bar continues very firm here, and has further advanced one tenth of a cent at the Mills in Philadelphia, being now quoted 5 3 10 cents. We note a sale of 100 packs Russia Sheet, at 17¼ cents gold.

PHILADELPHIA, Sept. 23.—(From Circular of Edward Samuel.)—Lehigh Pig continues extremely firm but little offering. In Irons of inferior quality there is more disposition to sell at concessions, but no large transactions are reported in any kind. Manufactured Iron continues active and advancing. The Philadelphia Mills have advanced the base price of Refined Iron to 5-3 cents per lb. We quote American No. 1 Foundry Pig, at Furnace $53a55; No. 2 $50a52; No. 3 Forge, $46a48; No. 4 White and Mottled, $42a44; American Refined Bar (Mill price), 5-3 cents.

LEAD—Pig remains dull, and prices here do not respond to the more favorable quotations from abroad. Ordinary Foreign nominally $6,42½a6.45 per 100 lb. gold,

Bar 9½ cents, Sheet and Pipe 11, and Tin-lined Pipe 16½, all less 10 per cent. to the Trade.

COPPER—There has been no change in the prices of manufactured Copper and Yellow Metal in several months, and we continue former quotations. Ingot is still dull and prices irregular, but have favored buyers. The sales embrace 200,000 lb. at 33 cents, and for small lots 33½, cash. In England the official quotation has been reduced £10, Chili Bars, now £86 10s., and Best Selected £95a£96. It is said, however, that is only £5 below the last commercial quotation.

SPELTER—Foreign is without demand, and our quotation of 6¾a7 cents gold, is nominal, Domestic 10 cents currency.

STEEL—The market is steady and very firm at our quotations.

TIN—The business in Pig is still very limited, both buyers and sellers being apparently disposed to wait the result of the Dutch sale. We have only to note the sale of 100 slabs Straits at 33½ cents gold. The stock of Straits and English seems to be held firmly at this figure. Banca quoted nominally 40a41 cents gold. The market for Plates is still at a stand; holders are not disposed to make further concessions, as the Liverpool market is firm, the tendency there being rather towards an advance. In a jobbing way, there is a moderate business at the prices previously current.

ZINC—Mosselmann Sheet is firm at our quotations for lots from store, and 9½ cents less 4 per cent., gold, for parcels from agents hands. Manganese black oxide 3½, Pyrolusite 5½.

METALS.

NEW YORK, September 25, 1872.

IRON.—Duty: Bars, 1 to 1¼ cents ℔ lb; Railroad, 70 cents ℔100 lbs.; Boiler and Plate, 1½ cents ℔ lb; Sheet, Band, Hoop, and Scroll, 1¼ to 1¾ cents ℔ lb; Pig, $7 ℔ ton; Polished Sheet, 3 cts. ℔ lb; Galvanized 2½; Scrap Cast, $6; Scrap Wrought, $8 per ton. All less 10 per cent. No Bar Iron to pay a less duty than 35 per cent. ad val.

	Store Prices.
Pig, Scotch—Coltness ℔ ton	— —@60 00
Gartsherrie	56 00@57 00
Glengarnock	54 00@55 00
Eglinton	52 50@53 00
Pig, American, No. 1	55 00@57 00
Pig, American, No. 2	53 00@54 00
Pig, American, Forge	48 00@49 00
Bar Refined, English and American	115 00@120 00
Bar Swedes, assorted sizes, gold	120 00@130 00

	Store Prices, Cash.
Bar, Swedes, 1¾ to 5 x ¾ & ⅞ 2 sq. & 6 to 12 x ¾ & ½	145 00@155 00
Bar, Refined, ¾ to 2 in. rd. & sq. 1 to 6 in. x ½ to 1 in.	— —@120 00
Bar, R-fined, 1¼ to 6 by ¼	125 00@— —
Bar, Refined, 2¼ to 2⅞ round 1 & 1¼ by ¼ & 5:16	127 50@— —
Large Rounds	127 50@140 00
Scroll	140 00@170 00
Ovals and half-round	140 00@160 00
Band	— —@135 00
Horse Shoe	130 00@140 00
Rods, ⅜ to 3-16 inch	125 00@165 00
Hoop	145 00@190 00
Nailrod	@ 9
Sheet, Russia, as to assortment (gold)	17¼@ 17½
Sheet, Singles, D. and T. Common	—7½@— 8½
Sheet, D. and T. Charcoal	—8½@— 9
Sheet, Galv'd, list 10 per cent discount	—@— —
Rails, English (gold), ℔ ton	75 00@ 76 00
Rails, American, at Works in Pennsylvania, currency	85 00@ 90 00

COPPER.—Duty: Pig, Bar, and Ingot, 5; old Copper 4 cents ℔ lb; Manufactured, 45 per cent. ad val.

	All Cash.
Copper, New Sheathing, ℔ lb	— @— 43
Copper Bolts	— @— 45
Copper Braziers, 16oz. and over	— @— 45
Copper Nails	— @— 45
Copper, Old Sheathing, &c. mixed lots	26 @— 28
Copper, Old, for chemical purposes, 14@16 oz.	— @— —
Copper English Pig	32¼@— —
Copper, American Ingot	33 @— 33¼
Yellow Metal, New Sheathing & Bronze	— @— 30
Yellow Metal Bolts	— @— 32
Yellow Metal Nails	30 @— 32

LEAD.—Duty: Pig, $2 ℔ 100 lbs.; old Lead, 1½ cents ℔ lb; Pipe and Sheet, 2½ cents ℔ lb.

Galena, ℔ 100 lbs	$— — @— —
Spanish (gold)	— — @6 45
German, do.	— — @6 45
English do.	6 50 @7 00
Bar (net)	9 25 @— —
Pipe (net)	— — @11 00
Sheet	— — @11 00

Colwell, Shaw & Willard Tin-Lined Lead Pipe 16½ cts. ℔ lb.

STEEL.—Duty: Bars and ingots, valued at 7 cents ℔ lb or under, 2¼ cents; over 7 cents and not above 11, 3 cents ℔ lb; over 11 cents, 3½ cents ℔ lb. and 10 ℔ cent ad val. Store prices.

English Cast (2d and 1st quality) ℔ lb	— 16¼@— 20
English Spring (2d and 1st quality)	— 9½@— 10½
English Blister (2d and 1st quality)	— 11½@— 16
English Machinery	— 11¾@— 13¼
English German (2d and 1st quality)	— 11¼@— 12
American Blister "Black Diamond"	— — @— 11½
American, Cast, Tool do.	— — @— 17
American, Spring, do.	— — @— 11
American Machinery do.	— — @— 11½
American German, do.	— 9 @— —

TIN.—Duty: Pig, Bars, and Blocks, 15 ℔ cent. ad val.; Plate and Sheets and Terne Plates, 25 ℔ cent.; Roofing 25. ad val.

	Gold ℔ lb.
Banca	40 @41
Straits	33½@—
English	— @33½

PLATES. *Fair to Good Brands.*	*Gold.*	*Currency.*
I. C. Charcoal, ℔ box	$13 00 @13 25	$15 25 @15 50
I.C. Coke	11 75 @12 00	14 25 @14 50
Coke Terne	10 50 @11 00	12 25 @12 75
Charcoal Terne	11 50 @12 00	13 25 @13 75

SPELTER—Duty: In Pigs, Bars & Plates, $1.50 p. 100 lb

Plates, Foreign (gold) p. 100 lb.	6 75 @ 7 00
Plates, Domestic p lb.	8¾@— 11

ZINC—Duty: Pig or Block, $1.50 per 100 lb.; Sheet 2½c. per lb

Sheet per lb.—	10 @ 11

San Francisco Stock Market.

BY TELEGRAPH.

NEW YORK, Sept. 26, 1872.

The following reports from the San Francisco Stock Board are dated the 19th and 24th. A comparison of the two evinces a continued downward tendency of the market. Raymond & Ely is appended to the report quoted at $167, and Meadow Valley $23 per share.

	Sept. 19.	Sept. 24.
Savage	— 115	107
Crown Point	— 126	115
Yellow Jacket	— 109	100
Kentuck	— 240	—
Ohollar Potosi	— 67	62
Gould & Curry	— 197	170
Belcher "New Issue"	— 102	90
Imperial	— 9	8
Hale & Norcross	— —	—
Eureka C. V.	— —	—
Ophir	— —	—
Alpha	—	—
Raymond & Ely	— 170	167
Meadow Valley	23¼	23

American Institute of Mining Engineers.

OFFICIAL BULLETIN.

Announcements to Members and Associates.

I. The dues for the year ending May, 1873, are now payable. All members and Associates who have not paid their dues are requested to do so at once, by sending in postal orders, or checks, or money, ten dollars to the Secretary.

All members and Associates who pay their dues for each current year, strictly in advance, will have sent to their address, regularly and weekly, the ENGINEERING AND MINING JOURNAL, which is the organ of the Institute, and will contain the proceedings and transactions, and all important papers read before the Institute and all notices of meetings. Back numbers cannot, as a general rule, be sent.

II. It is expected that the more important papers read before the Institute, and the debates thereon, will be published in annual or occasional volumes to which those Members and Associates will be entitled who have paid their dues.

III. All authors of papers are requested to notify the Secretary in advance of the meetings, giving the subject and length of their papers. Attention is also called, in this connection, to Rules 12 and 13.

IV. The ninth rule has been amended, so that there will be hereafter three meetings a year, in February, May and October. The meeting next October will be held at Pittsburgh, Pa.

Wilkesbarre, Pa. MARTIN CORYELL, Secretary.

The Secretary of the Institute has issued the following announcement.

The next meeting of the Institute will be held at Pittsburgh, Pa., Wednesday, October 16th, at 8 o'clock, P. M.

The Monongahela House is designated for members to assemble at, and the place of meeting to be hereafter announced.

The objects of interest in and about the City of Pittsburgh are so many and so diversified, that they cannot all be visited, and the selection will be mostly left to the members.

A meeting of the Council will be held at 11 o'clock A. M, Wednesday, October 16th, at the Monongahela House, and promptness is urged for the disposal of important business.

By order of the Council,
MARTIN CORYELL,
Secretary.

THE
American Trade Journal.

Particularly devoted to the general trade interests of the country, has an established commercial circulation exceeding

40,000 COPIES,

extending throughout the United States, and to Great Britain, Brazil, Mexico, Central America, Buenos Ayres, Chili, Australia and Japan.

It has been the agent for the successful introduction to notice and sale of American productions in the countries named; and, by a steadily increasing circulation in that direction, has proven the most valuable medium for our trade interests abroad as well as at home.

Published Weekly and Monthly under the auspices of the
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F. H. ROLLINS, 8 Church street, New York.
Oct.1.1.year

COAL SHIPPERS.

THE NEWBURGH ORREL COAL COMPANY
Mines at Newburgh, Preston Co., W. Va.
Company's Office, No. 52 S. Gay St. Baltimore, Md.
C. OLIVER O'DONNELL.....President.
CHAS. MACKALL.....Secretary
This Company offer their very superior Gas Coal at lowes market prices.
It yields 10,996 cubic feet of gas to the ton of 2,240 lbs. of good illuminating power, and of remarkable purity; one bushel of lime purifying 6,792 cubic feet, with a large amount of coke of good quality.
It has been for many years very extensively used by various Gas Companies in the United States, and we beg to refer to the Manhattan, Metropolitan, and New York Gas Light Companies of New York, the Brooklyn and Citizens' Gas Light Companies of Brooklyn, N. Y., the Baltimore Gas Light Company of Baltimore, Md., and Providence Gas Light Company, Providence, R. I.
The best dry coals shipped, and the promptest attention given to orders. sep21-1v

COXE BRO.'S & CO., CROSS CREEK COLLIERY, MINers and Shippers of the Celebrated
Cross Creek Free Burning Lehigh Red Ash
COAL.
FROM THE BUCK MOUNTAIN VEIN.
OFFICES:
Philadelphia, No. 206 South Fourth street.
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ANTHRACITE AND BITUMINOUS
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Miners and Shippers of
GEORGE'S CREEK COAL
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THE DESPARD COAL COMPANY OFFER THEIR Superior DESPARD COAL to Gas Light Companies throughout the country.
MINES IN HARRISON COUNTY, West Virginia.
Wharves, Locust Point, } Baltimore.
Company's Office, No. 29 South st. }
AGENTS:
PARMELEE BROTHERS, No. 32 Pine street, New York. BANGS & HORTON, No. 31 Doane street, Boston.
Among the consumers of Despard Coal we name Manhattan Gas Light Co., New York; Metropolitan Gas Light Co., New York; Jersey City Gas Light Co., Jersey City, N. J.; Washington Gas Light Co., Washington, D. C. Portland Gas Light Co., Portland, Maine.
☞ Reference to them is requested. may30-1y

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STEAM PUMP
A. CARR, Manufacturer & Proprietor.
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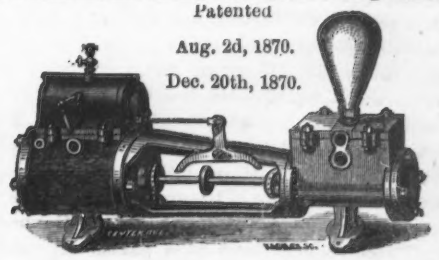
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It is unsurpassed. Also,
Steam, Gas and Water Pipe, Brass Work.
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STEAM PUMP,
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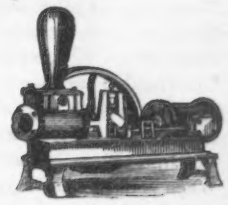
COMBINED.

These pumps are the cheapest first-class pumps in the market.
All sizes made to order at short notice.
JAMES CLAYTON, 24 & 26 Water st.,
Nov18-tf Brooklyn, N. Y.
Office: 50 & 52 John street, New York.

The Vienna Exposition.

It is but right that our readers should have some account of that great Exposition which is to take place in Vienna next summer, though this country has so little part in it. Compared with its predecessors it makes an astonishing stride in the space and conveniences offered to exhibitors. The progress in this respect will be seen from the following table :

London (Hyde Park), 1851..	94,000	square yards.
Paris (Champs Elysées), 1855,	123,214	"
London (Brompton), 1862,	222,316	"
Paris (Champ de Mars), 1867,	527,646	"
Vienna (Prater), 1873,	2,783,809	"

But the attention paid to convenient management is more important than mere space. It has been the general experience of all exhibitions that the goods for the most part arrive just before or after the opening, and hitherto the means of access to the buildings have not been sufficient to permit a prompt reception of the often unwieldy packages. All this has been guarded against at Vienna, where each country will have a direct and simple entrance in a wide front.

The center of the building will be formed by a dome 353 feet in diameter and 275 feet high. Those of our readers who have seen the Capitol dome in Washington may remember that that structure is 96 feet in interior diameter and 300 feet high, from which the vastness of the Vienna dome, also of iron, may be imagined. The size of other famous domes is as follows : St. Paul's is 35 metres ; St. Peter's, 49 metres ; Exhibition of 1862, 50 metres ; Vienna Exhibition, 108 metres. From this magnificent center stretches in one long line a building 2,968 feet long and 82 feet wide. Sixteen wings or transepts jut out from this building. Each is 672 feet long and 49 feet wide. Enclosed by these transepts are 24 courts, open on one side, of the same length as the transepts, and 114 feet wide. They offer very great facilities for receiving goods, and in case of need can be roofed over and used as "covered space." The nations will be placed in order of their geographical position from East to West, and it is one of the advantages of the disposition by transepts that if any nation is not ready, its space can be entirely closed up.

The situation of the building is to be in the Prater or Imperial Park of Vienna. From the figures we have given it will be seen that without enclosing any of the courts the space offered by the Vienna buildings will be 230,270 square yards. A park of 575 acres, nearly as large as the Central Park of New York, is appropriated to the objects of the Exhibition, and with all the halls and pavilions and the main buildings, something like 50 acres, will be under cover. Immense as the undertaking is, the work of building is progressing so well that "German order" receives new force as a phrase expressive of well-considered powers.

In the construction of the dome we notice details which remind us of the sight so often presented in our Western cities, of a great building rising heavenward on a forest of screws. Mr. SCOTT RUSSELL, who was consulted on the plans, suggested a similar method for raising the iron ring, 350 feet in diameter and weighing 650 tons, which forms the base of the dome. When at the proper height the ring will rest on 32 iron columns. Each of the thirty-two columns will rest upon a large bed of concrete, over a foundation of piles, which are driven in the ground. Each of these foundations carries a strong timber frame 20 feet high, with two suspended lifting screws. The ring having been bolted together on the ground, the men at each capstan raise it slowly up. Beginning July 8, the ring was raised 5 feet in three days. The iron-pillars are made in four pieces 20 feet high. When the ring is high enough the first set will be placed under it, and the scaffolding built up another 20 feet. These pillars or supports are constructed hollow, of plates and angle-irons, and are 10 x 4 ft. wide.

From the position of Austria in the extreme south-east of Europe, and its relation to many obscure nations whose productions are out of the usual line of exhibitions, there is no doubt that the collection gathered there will be to an unusual degree peculiar and remarkable. The Austrians are heartily supporting the works. More than 18,000, including Hungarians have applied for space, while in 1867 there were no more than 13,000 French exhibitors at Paris. Exhibitors of German mining and metallurgical objects will be 209, chemical industry 533, metallic industry 593, engineering 767, trades 1045, etc.

The Exhibition will open in Vienna on the 1st of May, and close on the 31st of October, 1873. Lists of the exhibitors, with detailed plan of space required must be sent in to the chief manager at Vienna before the 1st of January, 1873. No liability on the part of the exhibitors for ceilings, boarded floors, or the laying out of the gardens ; the cost of these will be defrayed by the Imperial Commission. The motive power for machinery will be supplied gratis. The Austrian regulations state that the price to be charged to each foreign country for the entire area of space demanded will be : in the Industrial Palace at the rate of ten florins per square meter (a square meter contains about 10½ square feet, and a florin is equal to about 50 cents,) and in the machinery hall at the rate of four florins per square meter. In the other parts of the Exhibition and grounds the rent per square meter will be : in the court-yards of the Industrial Palace, four florins, in the park, open air, one florin ; in spaces covered at the expense of exhibitor, 3 florins. Exhibitors of fine arts are exempted from any charges for space.

But this dry account gives no idea of what this great effort of the Austrian nation is to be. It is meant to be an element in the progress of the Austrian people. Shallow papers in this country have ridiculed the desire of the Austrians to have our means of teaching little children, whether by toys or special objects, fully illustrated. The subject is worthy of all attention and shows how carefully the Austrians mean to study the nations who bring not only their machinery and products, but evidences of the educational influences, both obvious and obscure, amid which they grow up.

The Production of Anthracite.

In the course of a lecture recently delivered to his class in La Fayette College, Professor P. W. SHEAFER furnished some interesting and valuable statistics of the production of anthracite in Pennsylvania, of which the following is a recapitulation :

PROGRESS OF PRODUCTION IN DECADES.

In 1820 were produced.....	365	ons.
From 1820 to 1830 were produced....	533,194	"
From 1830 to 1840 "	5,940,270	"
From 1840 to 1850 "	21,893,163	"
From 1850 to 1860 "	63,981,807	"
From 1860 to 1870 "	114,319,161	"
From 1820 to 1870 (fifty years).....	206,668,325	"
Great Britain in 1870 alone.....	110,431, 192	"

To estimate the future consumption of anthracite on the basis of the above figures, we must take into account the increase of population, thus :

1830. Population 12,866,020. Consumption, 1 ton to 24 persons.
1840. Population 17,069,453. Consumption, 1 ton to 3 persons.
1850. Population 23,191,876. Consumption, 1 ton to 1 person.
1860. Population 31,641,977. Consumption, 2 tons to 1 person.
1870. Population 38,555,983. Consumption, 3 tons to 1 person.

Mr. Sheafer's estimates of the areas of the different fields are as follows :

SCHUYLKILL COAL FIELD.

	Sq. M'ls.	Acres.
1. East of Tamaqua, mostly covered by the lands of L. A. & N. Co.....	16	10,240
2. Tamaqua to Pottsville.....	36	23,040
3. Pottsville west to fork of Basin.....	55	35,200
4. North Fork, Lyken's Valley Prong..	16	10,240
5. South Fork, Dauphin Prong.....	15	9,600
6. North Mine Hill Range.....	8	5,120
Total area of the first or South field	146	93,440

SECOND OR MIDDLE COAL FIELD.

Shamokin District.....	50	32,000
Mahanoy.....	41	26,240
Beaver Meadow, Hazleton, Big and Little Black Creek Basins.....	35	22,400
	126	80,640

THIRD OR NORTHERN COAL FIELD.

.....	198	126,720
Total area of anthracite coal fields	470	300,800

Taking the Southern field as averaging in total thickness of its beds 75 feet, the Middle and Northern fields 45 feet, he makes :

Total contents of the region.....26,361,076,000 tons.
Or practical contents, deducting 50 per cent. for waste.....13,180,538,000 "
Already mined out.206,666,325 tons.
Doubled for waste..... 412,332,750 "
Balance to be won.....12,767,205,250

Peat Fuel for Iron Furnaces.

No other bad cause ever received the persistent puffing which peat fuel for use in furnaces has had. Attempts to use it were begun a century or two ago in Europe, and have been continued with remarkable persistence ever since, in nearly every country, under circumstances the most favorable to success, and with all this labor, peat, as a fuel, stands just where it did in the beginning. But failure has not lessened the ardor of its advocates. Papers, called scientific, urge its use; men with money go on experimenting; railroads try it again and again, and although not one established success is recorded, and though the inconvenience, cost and waste have been well proved, the whole subject is still under investigation, just as if it had never been tried. We acknowledge that this is the way to obtain success if such a result is possible. We admire, too, the gallantry of these knights of the bog, and we know very well that the best expert, educated by long experience and the knowledge of innumerable trials, to disbelieve in peat, may have his confidence in his own mental integrity momentarily staggered by the unconditional assertions of his opponents. We offer the following as a proof of what we have said as to the persistence of the peat men, premising that this is but one phase of what seems to be a decided revival of the oft exploded peat bubble.

The little peat furnace near Ishpenning, Lake Superior, is again in order, and is, we presume, in blast by this time. It is the intention to use for fuel 75 per cent. of peat and 25 per cent. of charcoal. The result will be looked for with intense interest. If the experiments which are being made at this furnace shall demonstrate that peat fuel can be successfully used in blast furnaces, new iron centers will spring up, the production of pig iron will be increased, and the present high price of the article will be reduced—then, perhaps, we can send our "pigs" to markets across the water, and beard the British lion in his den.

We agree entirely with our contemporary. If the experiments succeed the British lion won't have a hair left in his hide, to say nothing of his chin. More than that, the number of national animals who will stand on foreign shores and howl at the American Republic, will be great enough to form a menagerie that will rival Mr. A. WARD'S snake show.

The success of the Fairlie engine in Russia, in connection with the narrow-gauge system, seems to be complete, and Mr. Robert Fairlie has received a letter from Count Bobrinskoy, on behalf of the Emperor, forwarding a bronze medal, and attributing the success of the Livny railway in a great measure to his engines and careful inspection. The medal has been stamped in commemoration of the opening of the line, and will be distributed to all those who took a part in its construction.

THE ENGINEERING AND MINING JOURNAL.

ROSSITER W. RAYMOND, Ph. D.,
JOHN A. CHURCH, E. M.
Editors.

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Mr. JOSIAH MASON has signified his intention to found a science college in Birmingham, specially fitted to the wants of the town and of the district around it. He has bought a site and also endorsed the school. This is what our country needs. Of Universities we have enough to get along with very well, while of the lower grade, and more practical schools, of which Europe has about ten to one University, we have not in this country one example. Our educational mentors continually call upon us to look higher; but what the trades need is founders of schools who will look lower, and give to the aspiring workman the opportunity to make himself master of his calling.

THE first storm in Salt Lake Valley comes early this year, and if it presages a long winter (a hard one is a tolerable certainty there), the miners had better make their preparations for using the season to advantage. Winter in the West ought to be the time for opening mines, preparing them for extended work or for sale. We are convinced that the time will come when the value of this season of quiet will be recognized, but it has not come yet. Miners allow the snow to find them without timbers, and perhaps without a cabin at the mine, and they are unable to put in more than half a winter's work with an excellent prospect of "a cave" as soon as the thaw sets in. To those who mean to work their mines next summer we say, put in your shafts and drifts now, and have a good "face" by the time you can work in it. And to those who mean to sell we say the same. Many a good sale has fallen through for the lack of work in the mine.

OUR correspondent A. W., whose communication is published on another page, has discussed in a proper manner three important subjects about which there is a great deal of misrepresentation. They are the presence of arsenic and antimony in Western ores; the real character of the Georgetown (Colorado) mines—whether genuine lead ores or more properly zinc ores; and finally, the character of the few publications which form almost the only body of information about the mines of that Territory, outside of the government official reports. This part will appear next week.

Nothing is more ridiculous than the wide-spread misapprehension existing in relation to the presence of arsenic and antimony in the average ores of the West. A year ago the story circulated in Utah that the English smelting works were able to overbear all American competition from the fact that they made the antimony in the Emma and similar ores pay $23 a ton. As they paid nothing for this metal and it was asserted that their charge for smelting was $25 a ton, the Utah prospectors saw clearly, that the cost of treating the ore, after deducting the proceeds of the antimony, was only $2 a ton. These same men supported their assertion by another of quite the same character. They said that antimony was worth $5 a pound! When they were told that this metal bore no higher value than 15 to 17 cents a pound in New York they denied it, even with printed quotations before them, and the story held its way for months in the face of the most positive contradiction. In the same way we are often gravely told of the arsenic in the ores as a source of profit. Arsenic is a thing of so little value, that were it found pure in Colorado in masses as large and easily mined as rock salt usually occurs in, it would not pay to take it out and send it to the East. But though these facts were demonstrated long ago, we hear just as much of the arsenic and antimony stories as ever. We believe that there is in this country a metallurgical establishment founded by a firm of intelligent men on the representations of a would-be metallurgist, who asserted that he could make PURE ANTIMONY, in a commercial way, from the lead containing two per cent. and three per cent. lead of the West.

These, however, are but foolish errors and those who fall into them deserve their fate. But the next of A. W.'s subjects is more important. The Georgetown ores are undoubtedly "lead ores," but whoever accepts that assertion without further inquiry, and proceeds to embark in mining or smelting operations on the strength of it, will have three chances of failure to one of success Instead of benefitting the district his misconception of the ores would probably lead him into injuring it by adding another to the list of ill-adapted works.

A. W.'s account of the origin of the three accepted historical books on Colorado is equally well timed. He shows how they really misrepresent the country, and certainly our mining history proves that there is nothing a good district has to dread so much as misrepresentation; that is to say *over* representation. What has it advantaged Little Cottonwood to circulate the stories of the magnetic, specular and hematite iron ore mines reported there, the tales of vast amounts of arsenic, antimony, mercury, and every other possible ores? They can have been nothing but an injury to a district that will probably in the end prove to be one of the most wonderful centers of vein making activity in the world, and which will be better without these foolish tales. A. W. has given us a well considered antidote to some of the representative evils of our mining business.

The labor troubles continue in England and Scotland, and in the latter country the long postponed blowing out has taken place in several furnaces. Others are put on half blast and with warrants at 129 shillings, there is less iron produced in Scotland than usual. Singularly enough, the high price of meat, the failure of the potato crop and the critical condition of the grain harvest are looked upon as elements favorable to the iron maker; for by increasing the laborer's need of money they may increase his willingness to work. But with all the difficulties experienced by those iron masters who placed the whole make of their furnaces under long contracts, at a time when iron stood at about half its present price, there are others who report enormous gains. For instance the profits of Messrs. MERRY & CUNINGHAME for the last year amount to nearly £300,000; of the Monkland Steel and Iron Company to £150,000; and of Messrs. BAIRD, of Gartsherrie, with their 42 blast furnaces, as "estimated on good grounds," to £1,000,000. Connected with these asserted profits, the formation of the first named firm into a stock company is of interest. Mr. CUNINGHAME being dead, and the senior partner, Mr. MERRY, desiring to withdraw, the stock etc. of the firm were capitalized on the basis of £1,000,000, of which £370,000 were placed on the market. This was disposed of with such success that there were takers for double the amount. Looking at the reported profit, even when the extraordinary circumstances of the times are considered, this appears to be a very reasonable capitalization, though we believe that besides the cash, there is half a million of stock given. But even at that rate the English appear to be more cautious in their home investments than in those they make abroad.

The effect of the high prices upon some trades is exceedingly disastrous. Shipbuilding on the Clyde has almost stopped, so far as new orders are concerned, and some of the largest builders are preparing to pay off a great proportion of their men.

Prediction and Fulfillment.

IN looking back over the history of the world's material progress, we find many striking evidences of the sagacity with which the future is anticipated, for the mind, far outrunning man's present ability to perform, sees in the future the full completion of undertakings which, at the moment, it dare not even project. Some of these manifestations show such stupendous faith in what the ages are to bring forth, as to be positively ludicrous. CORTEZ taking up land on the Isthmus of Darien in order to monopolise the advantage of the ship canal which he firmly believed would be dug there, was about three centuries before his time. The early history of the railroad was a mixture of performance which to-day would be petty, and prediction which even we have not yet learned to fulfill.

But in looking over the field of present operations we find many of these old projects are either under trial, or else are undoubtedly creeping up to the time when they will pass from the sphere of vague prediction to that of actual if not very bold trial. That very investment of CORTEZ is a case in point. Two great cities of the world now afford three other illustrations. One is London in which an underground railway, once a dream of the enthusiast, is a reality; and in which pneumatic transportation, also one of the earliest suggested means of motion from place to place, though not yet carried out as the dreamer expected, is adding new proofs of its ability and usefulness every year.

An account of some recent experiments, for which we are indebted to *Engineering*, shows that much heavier weights are moved in the pneumatic tubes of the London post-office than most people imagine. The tube has a horse-shoe form, is 4 feet 6 inches high

and 4 feet wide. In it run trucks which are 10 feet 4 inches long and weigh about one ton each. A train made up of three of these trucks was sent by compression from Holborn to Euston Square, a distance of 3080 yards, over easy gradients, in 6¼ minutes or or at the rate of 13·7 miles an hour. The same train was drawn, by exhaustion, from Euston Square to Holborn in 5½ minutes, or at a speed of 19 miles an hour. The Post-office tube is 1658 yards in length and has two grades of 1 in 15 or 352 feet to the mile. Through this tube the same train was sent by compression in 2¼ minutes and drawn by exhaust in 3 minutes, or at a speed of 24·9 miles and 18·8 miles an hour.

In experiments made with heavier weights, trains of 2 to 20 tons weight were sent through the tubes at velocities varying from 11·35 to 17·31 miles an hour. The pressure obtained was about 6 pounds per square inch and it was found that increasing the load made but very little difference with the work of the engine; a result that seems to confirm those experiments which made the friction of the air on the tubes the principal cause of work.

But in London the fan is found to be the greatest consumer of work. When equal pressures were maintained in two tubes and one was suddenly shut off, the engine increased its speed only 5 per cent. proving that the chief source of resistance was still in motion and was the fan. The experience thus far had in that city with these tubes proves that heavy loads are more economical than light ones. Increasing the load from 2 to 20 tons the useful effect was increased about seven and a half times.

New York presents in its elevated, or as the popular name goes, "one-legged" railway another instance of an old prediction carried out in practice after years of waiting. After many ups and downs this road has now achieved success. It runs 14 trains each way daily, some of two and some of four cars. Probably 2000 persons travel on it in ten hours, almost all of them being through passengers. Of way traffic it has but little, for it is too far west to be convenient to those who are going up and down in the busiest part of the city. It is, however, a success, if we may take the general satisfaction which constant travellers have in its use. One of the loudest complaints of VANDERBILT'S removal of his railroad terminus from Thirtieth street to Fourth Avenue, was that the merchant would lose from 40 to 50 minutes a day by it. The value of the elevated road is shown by one illustration: At 5 P. M. a down town merchant, living on the Hudson River road, north of Yonkers, can reach, by the street cars, none but the 6.20 train. But, taking the elevated road and changing at Yonkers, he can travel beyond that point by the train which leaves New York at 5·30 and which being a little faster than the other, carries him to his home 50 minutes to an hour earlier. On the way to the city he saves in the morning, in actual running time, 20 to 25 minutes; so that the elevated road is really worth to him an hour and a quarter daily.

Thus three of the old projects are now realities. The men who first suggested these methods of transportation, under and over ground, are in their graves. They outran their time too far to profit by the sure growth of the world, a growth which they felt would lead up to the use of their projects. And there is many another old project, which, though wild at the time it was made, will within the remaining years of this century, come to its fulfillment through the operation of a sound and natural advance of human necessities and human powers.

BY mutual agreement between the managers and puddlers of the Round Oak Ironworks, England, the plan of working five heat turns was resolved upon, as an experiment, some weeks ago. The time to which the arrangement was to extend having elapsed, the men are again working under the old six-heat system.

Colorado Mines.

TO THE EDITOR—Sir: In your issue of July 30 Mr. V. W. objects to several statements I made in regard to some articles written by him for your journal.

In support of his statements, that "*many* ores would pay to work for arsenic and antimony," that zinc and antimony are *large* constituents of *many* veins," and in reply to my question, where such are found in Colorado, he says, that ores containing arsenic and antimony are by no means scarce, that the Kent lode is noticeable as containing the former and the German lode the latter, that brittle antimonial silver contains also antimony. Now I am fully conscious of the fact, that there is hardly a single gold or silver bearing vein in Colorado, which does not show at least a trace of one or both, but if V. W. will read my remarks over again, he will perhaps recognize the fact, that I never denied this. All I have asked him to do, is to point out lodes, which contain either arsenic or antimony *enough to pay now or in future for extracting them* by any of the now known methods; and that remains to be done yet. If, in naming the Kent and German lodes as such, he refers to the lodes of that name respectively on Quartz Hill and Bobtail Hill in Gilpin Co., I will say that I am acquainted with both. I have visited the former, worked the latter, made a great number of assays from both ores and never found either of the metals in sufficient quantity to make the lead buttons, obtained in assaying, decidedly brittle. As to the occurrence of arsenical iron and copper pyrites (by the latter I suppose V. W. means arsenical grey copper or tennantite with the formula 4 (Cu_2 Fe) S+As_2 S_3 and not 3 Cu_2 S+As_2 S_5) I have seen both of them in several of the Gilpin County gold lodes, also bournonite and tetrahedrite, but they occur in such diminutive quantities that up to this time not even a prospector, much less a mining engineer had the boldness to pronounce them *large* and *valuable* constituents of those veins.

Let us see what the antimony in brittle silver amounts to in quantity. I suppose V. W. will readily admit that 1½ per cent. of silver, equal to a little over 437 ozs. per ton is above the average value of the best silver ores of Colorado. Though it is far from being the case, let us for arguments sake assume, that the ore contained all this silver in the state of brittle silver, which is composed of about $68{,}5$ per cent. silver, $14{,}7$ antimony, the rest being sulphur; 675 ozs. of it would therefore yield 437 ozs. of silver, and not quite 100 ozs. of antimony, equal to about ⅓ of one per cent. If it is considered that 1½ per cent. is far above the real average value and at least one-half of the silver not in the state of brittle or any other antimonial silver, I must beg to be excused if I do not accept either of these lodes as such as I have inquired for.

In reply to my inquiry about the *many* lodes, which carry as much ore as the Gilpin, Beecher, New Boston, etc., *with 50 per cent. lead and enough silver to pay for mining and milling*, V. W. enumerates five lodes in Clear Creek Co. Of these I shall have to drop the Maine, Flora McLaine, Whale and Paymaster. The former two, because by V. W's. own statement, they do *not* carry 50 per cent. of lead, and the other, because they do *not* contain silver enough to pay expenses. Mr. STOELTING was for three or four months the Whale Co's. metallurgist, and Mr. MARTINE made *average* assays of Paymaster ore for Mr. TAPPAN, and by asking these gentlemen for the figures, which I do not feel at liberty to give, V. W. can easily find out that I am correct. The Chas. H. Mar lode I do not know. In Summit Co., V. W. gives 9 more lodes, whose great value Mr. WHITNEY, in his pamphlet, can hardly find words to sufficiently describe, from what cause we shall see hereafter. Mr. HOLLISTER, when preparing his, as a whole, very interesting and reliable book, copied from WHITNEY, because he could not visit Summit Co. in person. The former U, S. Commissioner of Mining Statistics East of the Rocky Mountains, Mr. JAMES W. TAYLOR, (to whom Colorado will be forever indebted for the large space and exhaustive description of her resources, generously given to her in his reports) copies it also. Thereafter the Colorado *Gazetteer* comes and copies, and finally I almost believe V. W. does the same, though not quite so correctly, as he calls the "Siberian" lode the "Silurian." I may be mistaken; it may be only a strange coincidence that he exactly enumerates the same 9 lodes as WHITNEY, but the whole affair, including the misprint, looks very, very suspicious, and I would almost venture to say that V. W. never saw a single one of those lodes and knows nothing about them. Certain is, that if he does know something about Summit County, his knowledge is confined to Ten Mile District, otherwise he would not possibly have forgotten to mention the Lucky, Cooley, Comstock, Napoleon, and other *representative* galena lodes of that county in support of his statement. However, so far as the galena bearing veins of Summit are concerned, I am perfectly willing to admit that there are plenty which carry from 1 to 2 ft. of ores, and not very few considerable more. Nevertheless, they do not exactly fit the case, first, because a large portion of their ore does not contain 50 per cent. of lead, but from 50 to 80 per cent. zincblende, and second, because apparently none carries silver enough to pay expenses, up to this time all attempts by both smelting and amalgamation to *profitably* work those ores, having proved ignominious financial failures. Those assays made by A. A. HAYES, I can inform V. W., were made of specimens, and very good ones too, and it might prove a very interesting study to follow up the immense discrepancies which always occur in the assay of a few fair pieces, selected by the owner for advertising purposes, and the actual average of the ore in bulk.

V. W. refuses to accept of the whole amount of ore treated during the year 1871–72 in the Clear Creek Co. reduction works as a criterion, whereby to judge the loss of lead. Now, he asserted, that *every* year thousands of tons of that metal *are* lost by the present method of treatment; I showed him that in one special year all the ore treated was only 2500 tons and that these did not contain one-sixteenth of the amount of lead he claims to be lost. To this he coolly replies, that it is no criterion whatever to judge by; the Baker Mill burnt down in that year, (which is not so,) the International worked its own ore; Stewart completed and tested his Airey furnace; a great deal of ore remained on the dump, and many lodes remained idle, because there was a reluctance on the part of millmen to treat heavy ores, and so on. Now, in the name of common sense, what has all this to do with the amount of lead that *has* been lost? I suppose it is not V. W's. intention thereby to prove that 2000 tons of lead *might* have been lost if 16 times as much ore had been reduced, or that the lead in the ore which remained on the dump and untouched in the mines *was* lost, because there was no chance to get it treated. My selection of the year 1871–72 does not suit him apparently, and though he cannot find statistics, he is consoled by the idea for which he gives a most excellent reason, that in previous years probably much more ore was treated and lead lost. As I am in possession of those statistics, I will have to disappoint V. W. by stating that the quantity of ore reduced in Clear Creek Co. in former years is as follows:

1870–71,—1800 tons.
1869–70,—1400 "
1868–69,—1100 "
1867–68,— 300 "

That, in spite of this fact, my occupation as an assayer was not gone, may perhaps partly be accounted for by the circumstance that I never ran an assay office in Clear Creek County.

V. W. is painfully surprised that he has to point out to me some of the copper bearing lodes of Colorado, he might, however, just at well have saved that trouble, as I never denied the fact that there were such. If he will have the kindness to read the cor-

responding passage once more a little more carefully he will see that I simply stated, "There are no *silver* lodes in Colorado, the gangue of which consists of the best copper ore and in considerable quantity." This statement he completely overthrows by announcing that Professor HILL's *matte* contains from 40 to 65 per cent. of copper, largely derived from the *gold* lodes of Gilpin. Now, I do not believe that V. W. could much surprise me by any statement he has made or may make, but I confess that this glorious contradiction came very near doing it.

The statement on the successful coking of Colorado coal, on a small scale, is cheerfully accepted, as being based on good authority.

V. W. tries also to uphold his hogback or slide theory. He claims that ores exposed for a long time to the influence of the atmosphere and water must necessarily be decomposed and washed down the hill. To an uninquisitive mind this looks very plausible, but it is not true, as far as the washing down is concerned. To prove this I will enumerate a few of the most prominent and best known lodes, which, without being protected by deep slides, contained rich bodies of ore right on the surface, the ore as well as the gangue matter being in nearly every instance perfectly decomposed, and water, at least up to June, abundant: Lilly, Coin, Snowdrift, Stevens, Baker, Belmont, Griffith, Magnet, Nickolls, Astor, Young, America, Edgar, Crystal, Bobtail, Gregory, Bates, Burroughs, Columbia, Hope, Orphan Boy, Phillips, etc., etc. Outside of this class of lodes are a large number, which, though being perfectly exposed, carry rich ore on top which is not a particle decomposed, and considering that not only the lode, but the surrounding country rock also is disintegrated and washed away we may recognize the fact, that only one class of things speaks strongly in favor of his theory, *i. e.* the exceptions.

It only remains for me to say a few words about the magnificent trifolio of authorities, on which nearly all of Mr. V. W.'s statements are based, viz., prospectors, WHITNEY and the Colorado *Gazetteer*.

The first we may readily dismiss. Every man who knows anything about mining and Western mining regions, is acquainted with those restless knights of pick, shovel and pan, every single one of whom carries half a dozen undeveloped fortunes in his pocket, and can usually see a good many feet further ahead of the pick than anybody else. They have done incalculable service in opening up the whole Pacific coast and the country owes them undoubtedly very much, but that fact does not entitle their stories and yarns to any more credit, than other people's.

J. P. WHITNEY'S pamphlet on the resources of Colorado was got up for distribution at the Paris Exposition, with the view of inducing foreign capitalists to invest money in her mines. He shows what the *best* pieces of ore from different lodes assay, and that Colorado, though at that time still laboring under the disadvantage of high cost of labor, materials and transportation, was a good mining country. At the time it was issued, everybody who knew anything of Colorado, her mines and their relative value, was astonished at the disproportionately large space allotted to Ten Mile District, in Summit County. The gold regions of Gilpin, Boulder, Park, Lake and Clear Creek Counties, which so far had furnished about nine tenths of all the bullion produced in Colorado, received the benefit of a few general remarks and the statement, that shafts from 300 to 400 feet deep had been sunk on the Gold Dirt, Bobtail and Gregory lodes. After mentioning the rich discoveries of Argentine and Griffith district, and the fact that there are mines in the Snake River country, he gives no end of detailed information and a glowing description of the wonderful exhibits of mineral wealth in Ten Mile District, which necessarily must have conveyed to every outsider, not acquainted with the facts, the idea that that district was the only one really worth mentioning, and all others of only inferior value, when compared with it. This was, however, exactly the impression which Mr. WHITNEY wanted to make, from the reason that the lodes, which he specified, were largely owned by him, and his main reason for volunteering to go to Paris at his own expense as Commissioner for Colorado, was his desire to sell that property, which he of course expected to do more easily by going as Commissioner for Colorado than as J. P. WHITNEY, Esq., owner of such and such mines. He succeeded also in inducing two distinguished gentlemen, Prof. SIMONIN and Col. HEINE, to come out with him to Colorado. They went to Summit County, looked at Mr. WHITNEY'S lodes and—went home again to Paris.

If after this explanation V. W. is still willing, to consider WHITNEY'S pamphlet good authority on Colorado mining matters, he is welcome to do so. I myself am obliged to rank it with those specimen pamphlets, issued 1863, '64 and '65 by New York Companies, who wanted to sell their stock.

As to the Colorado *Gazetteer*, I happen to know something about that too. For a man, who has never seen Colorado, it is a dangerous book. Nearly all its statements are supported by facts and figures, all the different regions come in for their full share of statements, and the resources of the country are ably and exhaustively treated and stated. It is only natural for any green Easterner to deem the *Gazetteer* a most excellent and reliable book, for he does not, and cannot, know in what manner especially those figures were obtained. I am lucky enough to know this. I have myself given Mr. BIGNEY the statistics of a whole district. I am, in fact, I believe, the cause of V. W.'s ludicrous statement, that the lodes on MCCLELLAN Mountain, if they continue as they have been, would yield a fair percentage of copper. The statistics were collected in the following manner. The editor visited *honoris causâ*, one or a few of the noted lodes of a district (in my case one) took a look at the different spots where the biggest ore deposits were, and then adjourned to the office or boarding house for a social chat and a substantial dinner or lunch. Having had enough of both he proceeded to business and took notes of what he saw, and what the owner or agent of the mine told him, whether he saw it or not. Then he inquired about other lodes in the vicinity, depth of shafts, length of levels, character of ore and assays; but, mark it, the highest specimen assay was put down, and afterwards said, that lode contains so much ore of such character, worth so much per ton. The lodes of MCCLELLAN Mountain, which I stated to contain all a *little* carbonate of copper and some grey copper ore besides, were simply put down as copper-bearing; specimen assays were made to appear as the average value of ore in bulk.

The Colorado *Gazetteer* has its value. It is an excellent business directory of Colorado. A man who is able to read a little between the lines, is even able to find out who paid the largest bill for advertising, and extended the greatest courtesy to the editor in the somewhat substantial shape of dinner, but to cite the mining statistics therein contained, with the utmost gravity as undoubted and unassailable authority, that requires an amount of boldness which few men do possess.

A. W.

On Filiform Native Silver.

BY DR. J. H. GLADSTONE, F.R.S.

Native silver occurs frequently as metallic threads or wires twisted in every direction, and often bent at sharp angels. Specimens of this filiform silver were exhibited, from Kongsberg, in Norway, associated with greenstone, and it was shown that the metal was tough and non-crystalline. Precisely similar threads of silver were produced under the microscope, by decomposing a solution of nitrate of silver with suboxide of copper. The white filaments shoot forth in every direction, and twist about or double back in their course; while the cuprous oxide becomes black, splitting up, in fact, into cupric oxide and cupric nitrate. Most of these threads are so fine that their diameter is only 1-25000th of an inch, and a gramme of such silver wire would stretch from London to Brighton, and many are much finer still. Sometimes these filaments will end in crystalline knobs, or crystals of silver will form upon them, as is not unfrequently the case in mineralogical specimens. Attempts to prepare them by means of other substances than suboxide of copper had not proved successful; but, as that substance is by no means a rare mineral, it was thought that their formation might result generally from its action on silver salts in solution.

MINING SUMMARY.

Montana.

From the Deer Lodge *Independent* of Aug. 22.

FRENCH GULCH.

The placer mines of French, First Chance and Fenian, are paying as well as usual, and many, or perhaps more, men are profitably employed this season than last. Allen's Bar diggings, north of town, are paying $15 per day to the hand, and the channel in which the best pay is found has been traced through the whole length of the bar. It will require several years to work them out. Several French companies are working in First Chance, and are said to be doing well. The Swamp claim, owned by Brownell & Co., has paid remarkably well all summer. Milot & Co., at the mouth of Lucky gulch, are working a large crew of men on diggings that pay from $10 to $15 per day to the hand. Further up the gulch J. W. Farwell & Co., are making $10 to $15 per day with a small head of water. In Fenian, Sam. Garrett & Co. are working in the same old claim, which will hold out as long and as far as water can be carried. Just how much they pay we could not learn, but conclude the pay is satisfactory to the proprietors, as they said nothing about selling. Sam intends to go East to spend the winter, but will return in the spring. Harry Eggleson & Co., have a hydraulic running on the bar above town, on First Chance; have not cleaned up yet, but expect good pay, as splendid prospects have been obtained in the ground. A French company are working in the bar opposite town, and are making $8 per day. Several Chinese companies are working in various places, and they must be making money, as they lay in bountiful supplies of "tangle leg," chickens, young dog, etc.

GERMAN GULCH.

The mines of German are paying as well as at any time for years. Dr. Beale is working several sluices, all connecting with the main flume; has a large amount of ground sluiced off, and we are pleased to note that he is making money. It will require years to work out his ground, and all the clear money taken out will directly benefit the country, as he has confidence in the future of Montana, and invests his surplus cash in real estate, stock, etc. The McCleery Brothers are herding about 25 Chinamen, who will be able to clear payment for their ground before the close of another season. Dennis Driscoll is working his claim with good results. The California boys, Ellerhorst, Spear, Stolte & Co., are running two large derricks and several sluices. The claims are paying well and will last for years. G. W. Moore, Foster & Co.'s flume is running as usual, and Tom Ford and Buckwalter are operating in the lower end of the gulch. Plenty of Chinamen are at work, and in many instances they succeed in making ground pay that white men considered worthless.

Nevada.

Correspondence of the Reese River *Reveille*.

HOT CREEK, NEV., Aug. 20, 1872.

MOREY—16 miles north.—The Morey Company are doing a good deal of work in the way of working mines, building a town and a mill; are extracting a large quantity of rich ore, working about forty men and, when the mill is completed next winter, it is expected they will have a flourishing camp and produce large quantities of fine bullion.

HUDSON & Co.—about 10 miles north of this camp—are sinking a shaft on a small vein of very rich ore, which will probably work nearly $1,000 per ton, with a flattering prospect for a prominent and valuable vein.

TYBO DISTRICT—about 12 miles south of this camp—is very quiet at present. Much work has been done in that district, and a large amount of ore is on the dumps. On the 2 G. vein there is probably 500 tons of $75 ore ready for milling, and thousands of tons of the same class of ore in sight ready for stoping that can be placed upon the surface at a less cost than $2 per ton. The 2 G. mine is certainly the finest mine and vein I have seen in the State, barring none, 1,200 feet of which is thoroughly opened the entire length with shafts and tunnels, showing a continuous and well defined fissure vein that will average 4

feet thick or more. This mine is for sale *cheap*, and I know of no safer investment for capital in the State for a legitimate mining operation than the 2 G. offers.

There are several other good mines in the district, abundant wood and water, and I see no reason why Tybo should not be one of the leading mining camps of the State, and the Hot Creek country become a noted bullion producing portion of Nye County.

LIDA VALLEY AND GOLD MOUNTAIN.—Jack Ober, who arrived from the above named localities last evening, reports everything lively in that section. People are coming in all the time and mining and prospecting are prosecuted with energy and success. Some Mexicans have struck several ledges of galena ore at Lida which carries from ninety to a hundred dollars in silver to the ton. The ledges or deposits are very extensive and present appearances indicate that sufficient ore can be extracted from the mines already opened to keep a smelting furnace running steadily. The milling ore extracted at Lida has to be transported to Deep Springs, forty-five miles distant where there is a five-stamp mill. It is proposed however to erect a mill and also smelting works at Lida this fall.

Mr. OBER showed us some fine specimens of horn silver and Stetefeldtite from the KELLY & OBER ledge at Gold Mountain. He brought in twenty-five hundred pounds of ore from that mine which will be worked at the Manhattan mill to-morrow. He also showed us a fine specimen of gold bearing quartz from the "Smart Aleck" ledge, showing free gold all over its surface.

The Reese River *Reveille* of Sept. 17, has the following Mining Review for the week ending Saturday, Sept. 14.

REESE RIVER.

All the mines on Lander Hill with, we believe, but one or two exceptions, were closed yesterday on account of the general desire on the part of the miners to pay a last tribute of respect to one of their unfortunate number. We believe every one of the steam hoisting works are shut down, and Lander Hill contained fewer men, probably, than on any recognized working day for many years past. It was therefore almost if not entirely impossible for us to visit the various mines and obtain the date and particulars for our weekly report; hence the unavoidable omission of a detailed review of the mines in this district for this week.

IONE.

CROWN.—Messrs. Beatie & Co. are erecting steam hoisting works on this mine, without doing any more dead work. They are now preparing to raise 50 tons of $200 ore per month. No mine in the district has ever looked better.

STONEWALL.—The E. M. & M. Co., have eight men employed on this mine running levels preparatory to stoping. Are taking out about one and a half tons of $100 ore per day.

MAMMOTH.

ESTA BUENO.—The company are now driving a third level at a depth of 210 feet with good ore; are stoping out about two tons per day of $200 ore from the second level.

ELLA FLORENCE.—Greenleaf & San Pedro, the owners of this mine, are sinking an incline now down about 20 feet; have a vein 4½ feet wide, one foot of which is $250 ore.

BELMONT.

The mining interests in this section are looming up. We have good reports from every quarter, and every one interested in the development of our mines seems satisfied that we are just commencing to reap the reward so long hoped for, and so justly due for the perseverance displayed in searching deep for the precious metals.

MONITOR CO.—Are increasing their force daily; are pushing forward their lower tunnel; now in over 350 feet; taking out some fine ore from the upper levels. Their new mill is nearing completion and is expected to start in about six weeks.

EL DORADO CO.—Are still stoping out from the big ore chimney in the 340 foot level, south of the main incline. To the surprise of many mining sharps this body of ore has increased in size till it is over seven feet thick and shows already over 100 feet in length. All this body of ore will do for milling with but very little assorting. A winze is started down from the 340 foot level, north of the incline, the whole size of which is in a body of black sulphuret ore. New turn tables have been put in at this level and the cars are kept running steadily on good ore.

ARIZONA MINE.—Still drifting north in the large body of chloride. Pay streak five feet thick.

BELMONT CO.—Have just let contracts for running new levels in the Canfield mine. Fine prospects for cutting the large chimnies at a greater depth.

COMBINATION CO.—The lessees of this property are doing a good business. They are taking out splendid ore; working 20 men.

JEFFERSON CANYON.

Some very rich horn silver ore was brought in from this district a few days since. Messrs. Hollis & Barney Muller are making a fortune out of their lease of some of the principal mines.

SAN ANTONIO.

Messrs. J. P Courtney & Co. are shipping some 60 tons fine ore from the Potomac and Liberty mines. These veins have been steadily worked by the above parties for the last two years, the ore having been taken to the mills of Austin, Mammoth and Belmont for reduction.

First-class miners are needed here. About 15 or 20 good men could get employment here at once.

ELKO.

[From the Independent. 14.]

IMPORTANT STRIKE IN RAILROAD DISTRICT.—An immense body of ore, of a richness unheard of before in the district, was exposed a few days since in the lower adit-level on the Last Chance vein. The strike occurred at a depth of 200 feet perpendicularly below the surface, and something over 100 feet below any point heretofore reached on the vein. The walls are very regular and well defined, and show the vein to be a fissure between a lime and granite formation, while the foot wall is lime. A reasonable calculation will show that Mr. Hussey has at least 20,000 tons of ore in sight in the Last Chance mine alone, and something of its value may be determined when we say that assays from the new strike show from $200 to $400 per ton in silver and the average not less than 55 per cent lead.

California.

GRASS VALLEY DISTRICT.

From the Grass Valley *Union* of September 15.

IDAHO MINE.—We visited the Idaho yesterday and were rather supprised to see the progress made in the construction of the new works. At the mill we found the bed of the new engine in place and it is a monster. The size of the cylinder is 20 inches, and it is calculated to run the 35 stamps that are to be put into place very shortly. A large number of carpenters are employed there. The frame work for the stamps is the most substantial. While all of the confusion incident to building is going on around the 15 stamps, they continue to rise and fall wtihout ceasing, and every drop produces its share of the precious metal. The mill is now all enclosed and presents quite a fine appearance at a distance. At the old mill we found the same life displayed. The little hoisting engine (a 10-inch cylinder) is kept on the jump—and as the engineers work eight hour shifts it is running the whole twenty-four hours hoisting rich quartz. An enormous amount of wood is used at this engine; we hear that three cords and a half are used on one shift. In the blacksmith shop we found two forges employed on work for the new machinery. These forges have not done any work in the way of sharpening drills, picks, gads, etc., for a long time this kind of work is done at a temporary shop built close at hand. At the new hoisting works we found the new machinery in place and at work. It works like a charm. The size of the cylinder is 20 inches with a five-foot stroke. The new shaft is down to the 400-foot level and completely timbered and finished all the way. We went down a few feet to see the shaft and can safely pronounce it the most substantial one in the township, for the timbers are large, solid and firmly fitted. The shaft is divided into four compartments. The east one is for a ladder way and pump; the next for a tub-way, and through which to continue the sinking of the shaft, and the other two are for cages for the ordinary work of the mine. Cages are to be used similar to those in the Eureka. The track for the cages is to be put in in a few days. The new shaft has been through for ten days. The whistle of the Idaho is a very large one, being somewhat larger than the one that was used at the Empire mill which was burned down. It has not been fully tested as yet, as steam has not been high enough up to fill it.

British North America.

OMINECA NEWS.

[From the Sentinel, August 17th.]

Mr. F. W. Herre arrived on Wednesday evening, the 14th inst., from Omineca, being 21 days on the road.

The trail to Steward's Lake was encumbered with fallen timber; some half a dozen men were repairing it. At the time Mr. Herre left, business was dull and matters looked rather gloomy, but there was a good chance of the mines turning out all right. Provisions and goods of all descriptions were cheap, there being much opposition in trade. Freight faom Quesnelle had varied from 10c. to 20c. There were about 600 men in the whole district. Smith & Sterling, Girod & Guichon, Graham and Jos. Cohen are all doing a fair business. Besides these there are about 15 other traders established in the mines, who are all doing more or less business. In general the miners are all doing well, and any one with energy, and who will work, has a good chance of making money. The daily returns from the mines average from $4 and $5 to $60, $80 and $100 to the hand. The shortness of the mining season and the previous high prices of provisions have been the principal obstructions which miners have had to contend with. This is all the more felt as no deep diggings, except those on Lost Creek, have yet been discovered. On Mason Creek fewer rich claims have been discovered than on its tributaries, Black Jack Gulch, Slate Creek and Lost Creek. On

BLACK JACK GULCH

Neil Cameron, John J. White & Co. are making from $30 to $50 per day. R. Hamilton and — Emery and others have made the same in the claim immediately below, and are now leaving for home satisfied with what they made. Above these claims J. Abbot and F. Lynch are not doing so well but are taking out pay. Below these there are several companies taking out pay. On

MANSON CREEK

the Discovery Flat is not turning out as well as expected, with the exception of Peterson's claim, which pays very rich. R. Clark, Chas. Jones, Mose Barber, and many other Caribooites, are working on the flat. James Orr, who is working in the immediate vicinity, is obtaining good prospects. Two miles below Howeltown, Harper, Tom McDougall and seven or eight more men in two companies are obtaining good pay—from $12 to $15 and $20 a day to the hand.

LOST CREEK

is considered the richest in the district. The Discovery Co. (consisting of James Carson, George Fairbrother, Griffiths, and four or five other Caribooites) is considered to be the best claim in Omineca. The shaft is between 50 and 70 feet deep, and the company is taking out big pay. Above the Discovery, Joe Irvine, Williscraft, Ward and others have made money, but they are now afraid that the pay is running out. Philip Starr and partners are located below the Discovery, and consider their claims good. On

SLATE CREEK,

between Germansen & Manson creeks, the best pay has been found on the banks 12 or 15 feet high, ranging from $8 to $60 and $80 per day to the hand. The population of this creek is 400 to 450 men.

GERMANSEN CREEK.

This creek is very dull at present. Several claims which paid well in spring have ceased to pay since high water, but it is expected they will again pay well in the fall. Doc. Holloway, George Kenny, Jas. Welsh, Felix, and many others well known here, are on this creek, and have claims that are more or less good. There are about 150 men on this creek.

Mr. Herre is of opinion that it will yet turn out to be a rich mining camp.

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an23,1y

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10	$ 4 60	1-10	$ 1 60	15	$ 1 60	1	$ 1 15
20	16 20	5-10	8 90	20	3 95	5	8 05
30	28 90	1	17 80	25	7 10	10	19 60
40	40 45	1½	27 05	30	11 10	15	31 85
50	52 05	2	36 60	35	14 15	20	45 45
60	63 80	3	55 20	40	17 25	25	58 80
70	76 60	4	73 35	45	20 20	30	72 00
80	87 90	5	92 10	50	23 50	40	96 20
90	100 60	6	111 40	55	26 30	50	127 35
100	111 70	7	129 80	60	29 50	60	155 70
110	124 40	8	148 15	65	32 85	70	185 00
120	137 20	9	168 30	70	36 30	And so on.	
130	148 55	10	186 80	75	39 50		
140	161 10	11	205 30	80	42 85		
150	173 60	12	225 45	85	46 25		
175	205 10	13	244 10	And so on.			
200	234 45	14	263 30				
225	265 85	15	283 85				
250	297 35	20	379 90				
275	329 70	And so on.					
300	361 50						
350	424 20						
400	486 25						
450	549 50						
500	613 75						
And so on.							

NOTE.—In the Original Tariffs the ton of ore is equal to 20 cwt. = 2240 lbs. English, whilst in these tariffs only 2000 lbs. avoirdupois are taken to the ton—thus 291,63 ounces troy of silver or gold in the ton are equal to 1 per cent. For silver contents above 1 per cent. (300 ounces in the ton of 2000 lbs.), generally 2 per cent. are paid in addition to the tariff prices.

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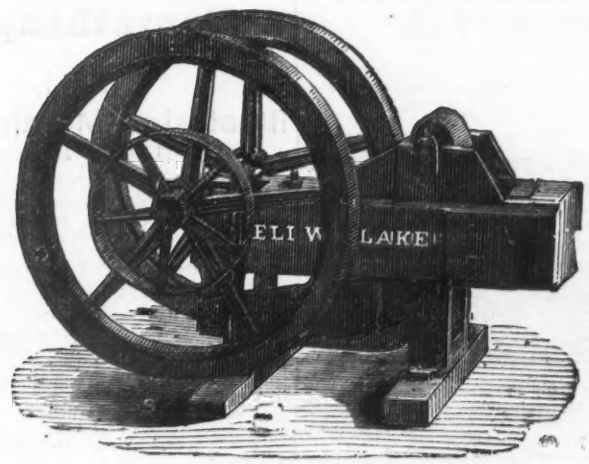

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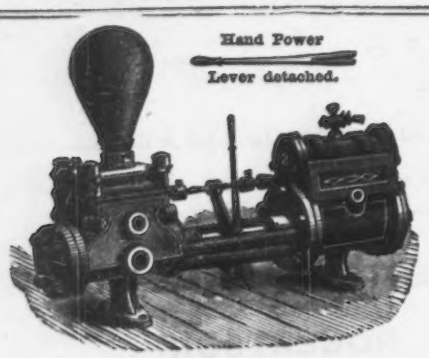

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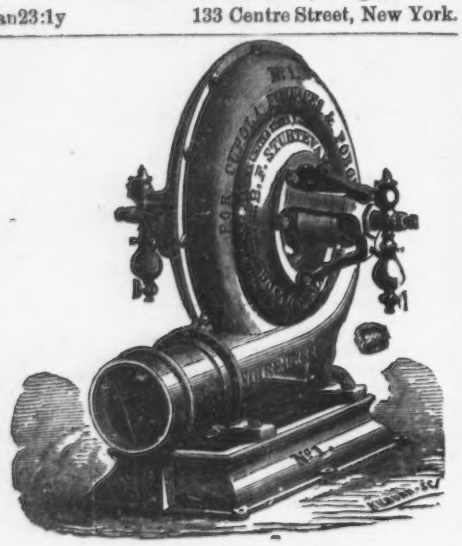

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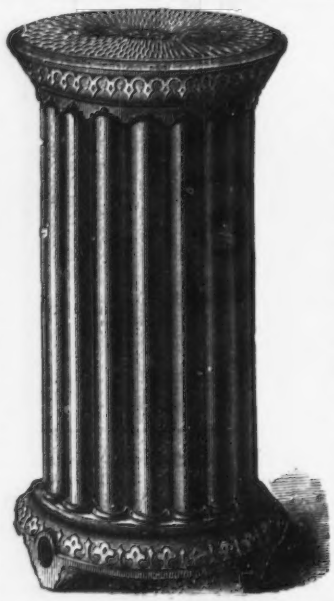

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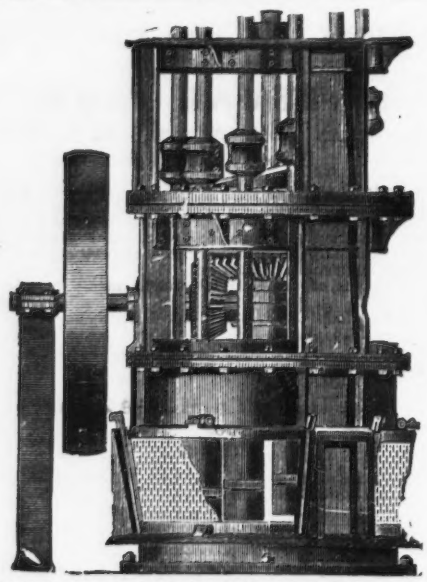

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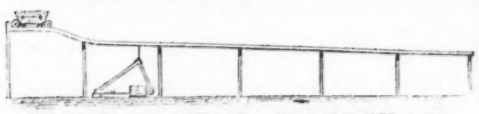

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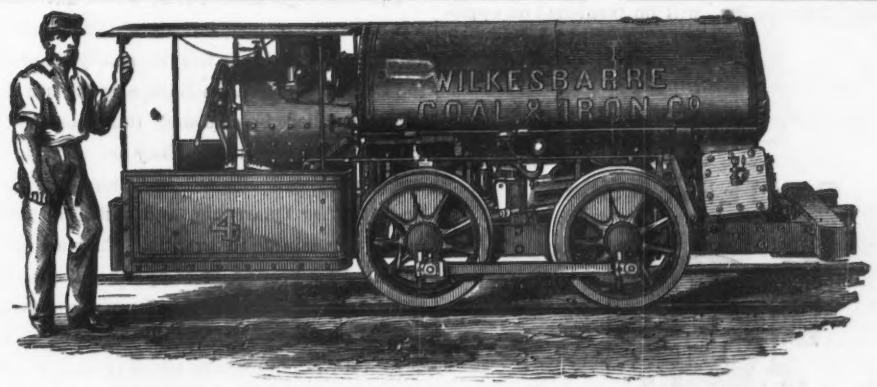

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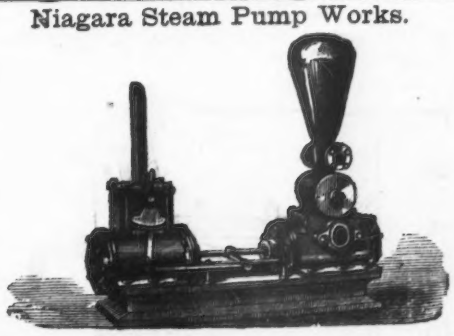

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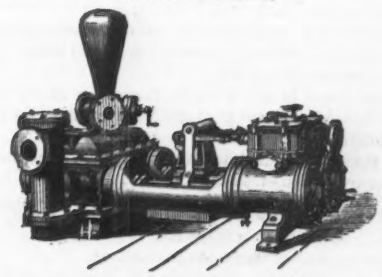

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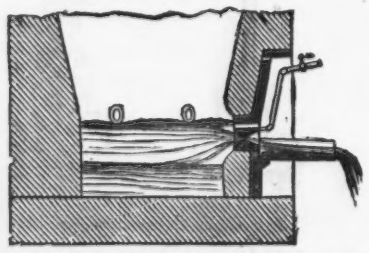

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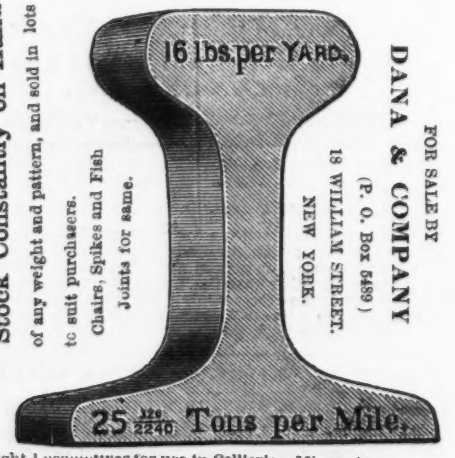

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